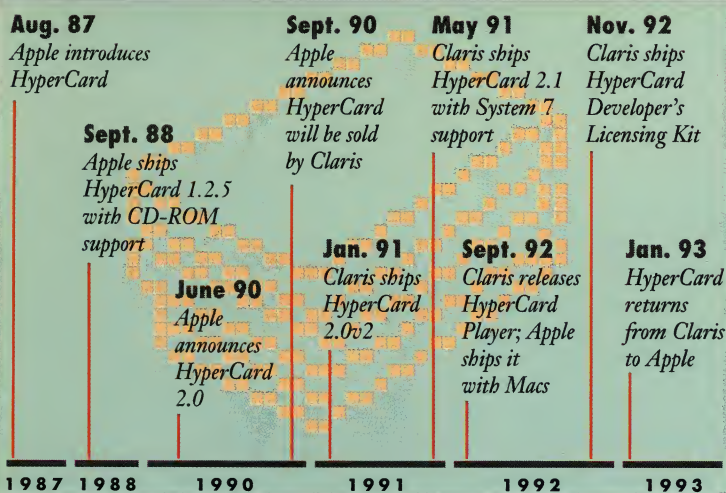


IN REVIEWS

- ✓ **form•Z 2.1.2**
The best solid-and-surface modeler
- ✓ **SuperATM**
Document portability becomes reality
- ✓ **Sound-editing software**
Audioshop 1.03 vs. SoundEdit Pro 1.0

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HyperCard's long, strange trip



HyperCard goes home, to link with AppleScript

Apple will take over development, support

By Raines Cohen

Santa Clara, Calif. — HyperCard is on the way home again.

Claris Corp. and Apple last week announced that responsibility for development, marketing and support of the user-programming tool will return to Apple.

Apple said it will integrate Hyper-

Card with AppleScript, its user-scripting technology, and will work closely with Claris to ensure a smooth transition and an upgrade path for current users.

Claris will continue to sell and support HyperCard until Apple ships a new release, probably in the summer or fall. AppleScript is due in the first half of the year.

"As our tools strategy has evolved and things like AppleScript have come closer to being an end-user

See HyperCard, Page 111

Aldus FreeHand, Adobe Illustrator sequels look alike

By Carolyn Said

San Francisco — Aldus FreeHand and Adobe Illustrator are both in line for upgrades that will increase the similarities between the two premiere PostScript illustration programs, according to sources.

New versions of FreeHand from Aldus Corp. of Seattle and Illustrator from Adobe Systems Inc. of Mountain View, Calif., are in pre-beta, sources said. Upgrades to both \$595 programs reportedly will ship by spring. Aldus and Adobe declined to comment.

► **FreeHand.** Version 4.0 features a streamlined interface that reduces the use of dialog boxes, sources said.

The upgrade will address user complaints about text entry and editing. These functions will be available on screen within a drawing, rather than requiring the user to go to separate dialog boxes to type text and set parameters. Illustrator already handles text in this way.

FreeHand users will be able to set text attributes with a new floating palette. Text will be more flexible, sources said. For example, users will be able to flow editable text from body copy to a curved line back to body copy. A zoom text feature will

See Illustration, Page 112

New Macs' lean prices offer hefty competition

Models may take on Compaq, Dell CPUs

By Jon Swartz

Cupertino, Calif. — Apple's new CPUs, to be announced next week at Macworld Expo in Tokyo, are among its most aggressively priced to date.

The new low-end and midrange Macs, which are priced competitively to grab market share from personal computer rivals Compaq Computer Corp. of Houston and Dell Computer Corp. of Austin, Texas, start from \$1,389 for the Macintosh Color Classic 4/80 (see chart). The full lineup, with prices, includes:

► **Mac LC III.** This CPU includes a 25-MHz Motorola 68030 processor, a 32-bit data bus, 4 Mbytes of RAM and a processor direct slot. It will be priced at \$1,379 in a 4/80 configuration and \$1,499 for the 4/160 model, according to sources.

► **Centris 610.** Apple's lowest-cost 68040-based system lets users choose either a 20-MHz 68LC040 — a version of the '040 without a built-in FPU (floating-point unit) — or a full-fledged 20-MHz '040. Users will be able to add as much as 68 Mbytes of

See Pricing, Page 112

New Mac pricing

MODEL	CONFIG.	PRICE
LC III	4/80	\$1,379
	4/160	\$1,499
Color Classic	4/80	\$1,389
Centris 610	4/80*	\$1,859
	8/80 E*	\$2,149
	8/230 E*	\$2,519
	8/230 E CD*	\$2,959
Centris 650	4/80*	\$2,699
	8/80 E FPU	\$3,189
	8/230 E FPU	\$3,559
	8/230 E FPU CD	\$3,999
Quadra 800	8/500 E FPU	\$4,379
	8/230	\$4,679
	8/500	\$5,429
	8/500 CD	\$5,869
	8/1000	\$6,399

*Optional '040 w/FPU can be added at time of purchase. FPU = Includes '040 w/FPU. E = Ethernet. CD = AppleCD 300i.

Business users take Mac CD-ROM for a spin

By April Streeter

San Francisco — Apple is busy putting a CD-ROM drive into current and upcoming Macs and handheld devices, and corporate customers seem ready to go along for the drive.

Many businesses are embracing CD-ROM, producing their own discs on in-house recording systems

and using them along with proliferating new titles for key business tasks.

American Airlines Inc. of Tulsa, Okla., is putting its maintenance manuals on CD-ROM and training mechanics and other employees to use them. "There's a lot of hype out there," said Mike Conley, American's CD-ROM project manager. "User acceptance of the technology

is an issue, and access speed is still an issue. Overall, though, for large-scale [organizations], it still wins."

Users have demonstrated that built-in drives are a hot commodity. Apple has a backlog of orders for its Performa 600 because it is having trouble obtaining enough CD-ROM drives to put into that popular configuration, Apple said. The 600's success also may buoy its hopes for the success of the 68040 Macs to be unveiled later this month. The Centris 610 and 650 and the Quadra 800 reportedly will offer optional built-in CD-ROM drives.

Handheld and consumer CD-
See CD-ROM, Page 111

Performa sales exceed projections

By Andrew Gore

Cupertino, Calif. — The Macintosh Performas put on quite a show last Christmas, exceeding projected sales. The new consumer Macs sold so well that Apple will offer new configurations this spring and may add some new models by year-end.

Keith Fox, general manager of Apple USA's consumer division, said the Performa 400 was the best seller, garnering 60 percent of the line's sales. The Performa 600 and 600 CD, with 25 percent of total Performa sales, did surprisingly well,

considering it was the most expensive of the three consumer Macs. In fact, the CD-ROM-equipped 600 sold so fast that Apple couldn't keep up with demand, he said.

"The CD phenomenon in the Mac industry is amazing. The CD is the gating factor [in Performa 600 CD shipments]," Fox said.

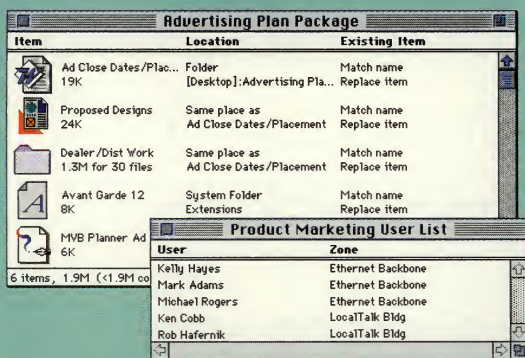
Only the Performa 200 failed to sell as well as projected, representing about 15 percent of total Performa sales, according to Fox.

The sales figures taught Apple that
See Performa, Page 112



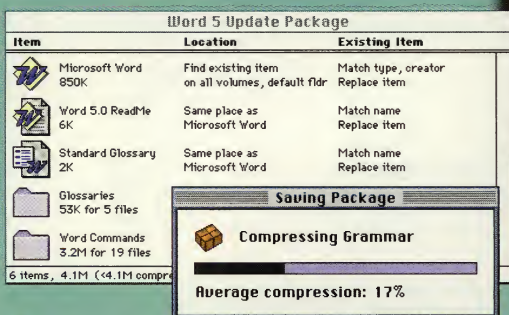
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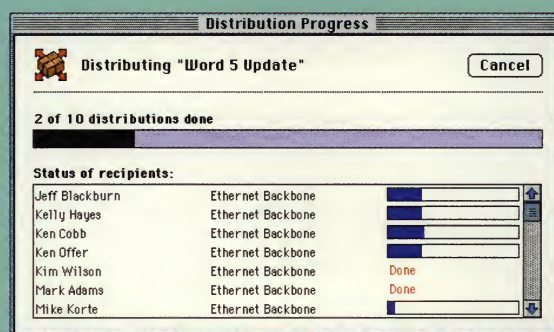
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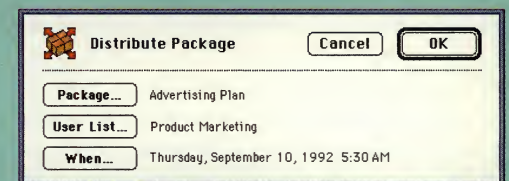
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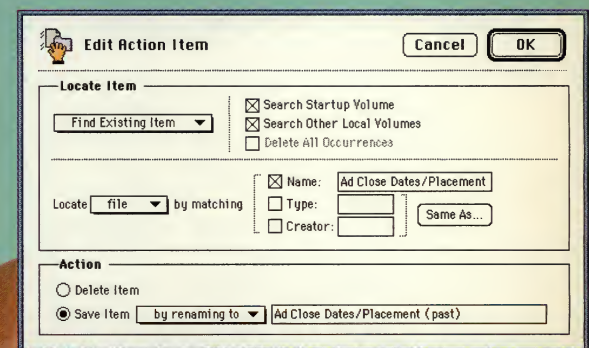
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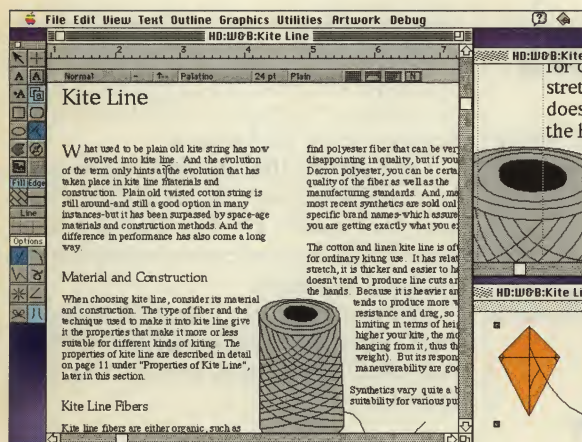
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Words&Beyond incorporates word processing with page layout, drawing and structured outlining. It features an intuitive, almost modelless interface based on the paradigm "just touch it to change it."

Words&Beyond goes beyond standard word processing

By Carolyn Said

Alameda, Calif. — Lundeen & Associates this week will introduce a word processor that it said will feature an intuitive interface and fluid integration of text and graphics.

Words&Beyond, which the company will unveil at Demo '93 in Indian Springs, Calif., will incorporate page layout, drawing and structured outlining, as well as standard word processing features.

Lundeen & Associates said the program's interface is almost modelless. Rather than require the user to click on tools or access dialog boxes, the cursor in Words&Beyond will change shape as it moves to show what will happen when the mouse is clicked. Users will be able to create new objects and edit both text and graphics without changing modes.

Word processing features will include tables, lists, drop caps, style sheets, tables of contents, indexing, footnotes, bibliographies and mail merge. Page-layout features will include multiple columns, multiple master pages, full text rotation, tracking and kerning. The integrated drawing will offer anchored, overlapping or embedded drawings

in text; text wrap around objects; and user-definable colors and patterns.

Other features will include multiple levels of undo, pattern-matching search and replace, and simultaneous multiple views of the same data.

Words&Beyond is based on a new object-oriented development environment called Author. Both the environment and the program are the creation of Tim Lundeen, a principal author of the original Microsoft Works.

Author is a set of platform-independent software tools and services that provide for sophisticated text and graphics handling, Lundeen said. With Author, the company will be able to create products that ordinarily would require 25 person-years of development in about five person-years, he said. He declined to specify future products other than a Windows version of Words&Beyond.

Words&Beyond will ship in the third quarter. Pricing has not been determined but will be less than \$400, Lundeen said.

Lundeen & Associates is at 1000 Atlantic Ave., Suite 107, Alameda, Calif. 94501. Phone (510) 769-7701; fax (510) 769-2078. □

Clariss adds ALSoft PB package to lineup

By Andrew Gore

Santa Clara, Calif. — Claris Corp.'s Clear Choice division last week signed an agreement to add ALSoft Inc.'s UP PowerBook utilities to its stable of low-cost software.

The package, which debuted last month (see MacWEEK, Jan. 4), includes a broad collection of utilities for PowerBook power management, security, hot keys and travel. Claris plans to ship the product by March for less than \$100.

The collection is geared to users of all skill levels and allows for easy setup of screen brightness and dim-

ming, processor speed, and hard drive and system sleep. It also includes sleep-savvy password protection, a selection of more visible cursors, configurable "sticky" menus and a start-up shortcut for airport security checks.

Clear Choice will market, distribute and provide technical support for the product, which will be renamed before it ships. Spring, Texas-based ALSoft will continue to develop the product.

Claris Corp. is at 5201 Patrick Henry Drive, Santa Clara, Calif. 95052-8168. Phone (408) 727-8227. □

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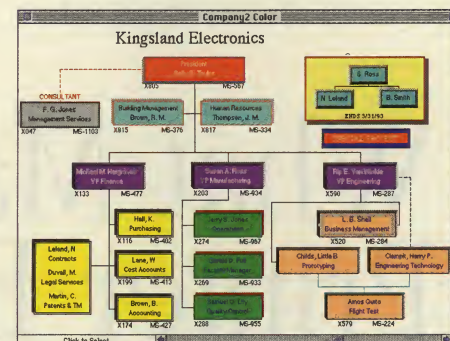
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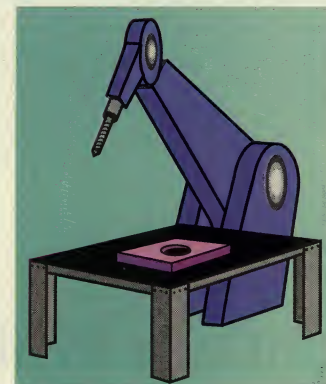
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Mac mail-order company will integrate IBM servers

By Jon Swartz

Tampa, Fla. — A veteran Mac mail-order company last month became a rookie reseller for IBM Corp. and Digital Equipment Corp.

Mac and More Inc., which has sold more than 30,000 Macs during the past three years, became the first mail-order company autho-

rized by IBM to integrate Macs with IBM's AS/400 midrange computers in the United States and Puerto Rico.

Mac and More also said it has received authorization from DEC to integrate Macs with DEC VAXes and printers.

Company President Gabe Calvo said

IBM AS/400 models 9402 and 9404 will be bundled with MacMidrange, a Mac-to-IBM midrange interface card from Andrew Corp.'s Bothell, Wash., office, and one of two high-end accounting and inventory software packages — System 2000 from Vormittag Associates Inc. of Islandia, N.Y., or Para Research

from Para Research Inc. of Gloucester, Mass.

The AS/400 bundles start at \$30,000 and can support as many as 150 networked users. According to Calvo, the AS/400 products will be supported by IBM directly.

Calvo said the IBM and DEC products will be available through the mail-order house later this month. He said Mac and More hopes to sell its newest wares to corporations and small businesses.

Mac and More Inc. is at 5414 Beaumont Blvd., Suite 210, Tampa, Fla. 33634. Phone (813) 886-9534 or (800) 846-4622; fax (813) 888-9535. □

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Apple app to emulate AS/400 5250 terminals

By Mitch Ratcliffe

San Jose, Calif. — Apple last week at the Client/Server '93 conference here introduced an application that adds support for AS/400 5250 terminal emulation on Macs running the company's SNA•ps Gateway.

SNA•ps 5250, due in the second quarter, will let Macs with Synchronous Data-Link Control (SDLC) or token-ring connections to an AS/400 server access minicomputer services available to 5250 terminals through a command-line interface. Mac clients on an Ethernet network also can access the AS/400 via the \$1,495 SNA•ps Gateway, which must run on a Mac with an SDLC or token-ring interface card.

The SNA•ps 5250 interface includes a tear-off key pad for controlling AS/400 functions, as well as a macro utility that can watch users and assemble a script based on their actions. Macros also can be attached to keys on the tear-off key pad.

Apple and IBM Corp. have not provided complete 5250 emulation because the AS/400 cannot yet support shared folders on the server or file transfers between the minicomputer and a Mac client. These capabilities, which are available for IBM PC and compatible clients, would allow Mac users to save files to the server.

Andrew Corp.'s Torrance, Calif., office reportedly will ship an AS/400-to-Mac printing utility that will allow IBM minis to print to a LaserWriter or ImageWriter.

Pricing for SNA•ps 5250 has not been set, but sources said the product will be priced similarly to Apple's \$345 SNA•ps 3270. □

Major upgrade for Data Desk

Ithaca, N.Y. — Data Description Inc. recently shipped Data Desk 4.0, a major upgrade to its \$595 statistics program with dynamic graphics and linked windows.

Data Desk now includes multivariate general linear-model analysis, new analysis tools that can cut out random "noise" by removing outliers to improve trend detection, and an internal virtual-memory scheme that can handle an unlimited number of cases with as little as 1 Mbyte of RAM available. Upgrades are \$99 until March 31, \$135 thereafter or free to users who purchased Version 3.0 after Oct. 15, 1992.

Data Description Inc. is at P.O. Box 4555, Ithaca, N.Y. 14852. Phone (607) 257-1000; fax (607) 257-4146. □

Print devices handle multipart forms

By Matthew Rothenberg

Camarillo, Calif. — Advanced Matrix Technology Inc. will hit the Mac impact-printer market next month with a line of dot-matrix devices that handle multipart forms.

The AMT FormsWriter series comprises eight configurations ranging from \$529 to \$1,190.

The four FormsWriter-240 models use 24-pin print heads that provide a maximum print speed of 240 characters per second and ship with a Mac printer driver that emulates the driver for Apple's ImageWriter LQ, which was discontinued in November 1990. The FormsWriter-290 printers include two nine-pin print heads, can output up to 540 cps and include a driver that emulates the ImageWriter II driver.

The devices also are divided between 85- and 136-column models that offer maximum print widths of 8.5 inches and 13.6 inches, respectively. Each includes a two-position tractor feed for pin-fed paper and comes with top, rear and bottom paper paths.

Mac users can connect to the FormsWriters via an RS-232C serial interface, and each printer also includes a Centronics parallel port. The devices alert users when they are jammed or out of paper, and some models include a demand-document feeder that tears off finished forms automatically.

Users of either the 85- or 136-column FormsWriters can purchase one-, two- or three-bin sheet feeders as well as a roll-feed device.

CIC introduces PenMac at Pen '93 conference

By Raines Cohen

San Francisco — If the writing was on the wall at the Pen '93 conference held here last week, pen-based Macs are not in the near-term future.

The only Macintosh at the show could be found in the booth of Communication Intelligence Corp., the Redwood Shores, Calif., developer showing MacHandwriter II — its Mac-compatible tablet — and companion PenMac software. The device, due in Japan next month, adds handwriting recognition and gesture control to Mac applications and system software. CIC plans a U.S. debut for the PenMac extension later this year (see MacWEEK, Jan. 18). PenMac, priced at less than \$100, will work with a variety of third-party tablets.

Users said they were impressed with the speed of kanji character entry possible with the tablet. "It's a lot faster than using a front-end processor," said Jerry Lander, owner of Azuma Lander International, based here. "With [non-pen] entry methods, you have to go kanji by kanji and post which one you want."

Also at the show, IBM Corp. of Armonk, N.Y., shipped PenDOS 2.0, an upgrade to its DOS extensions developed by CIC that add pen support to mouse-aware DOS applications.

Other companies showed off various desktop and notebook pen systems and applications for both PenPoint from GO Corp. of Foster City, Calif., and Windows for Pen Computing from Microsoft Corp. of Redmond, Wash. □

According to Charles LeCompte, editor of the Hard Copy Observer in Burlington, Mass., the arrival of the FormsWriters will be welcome news to Mac users frustrated by Apple's dwindling support for impact printers. "It's obviously a serious issue," LeCompte said. "You can't just forget about dot-matrix

printers. Even though it's a fading technology, it's certainly not dead, and for some applications (such as forms printing), it's still the best technology out there."

AMT printers will compete against Mac-compatible wide-carriage dot-matrix printers from GCC Technologies Inc., Epson America Inc. and Texas Instruments Inc.

Advanced Matrix Technology Inc. is at 765 Flynn Road, Camarillo, Calif. 93010. Phone (805) 388-5799; fax (805) 484-5282. □



AMT's FormsWriter line emulates ImageWriters.

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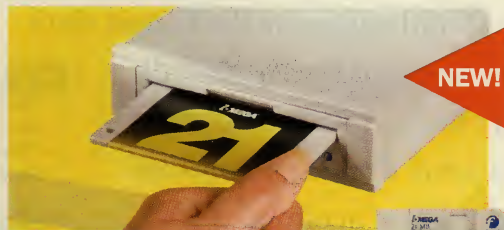
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By Ian G. Jacobs

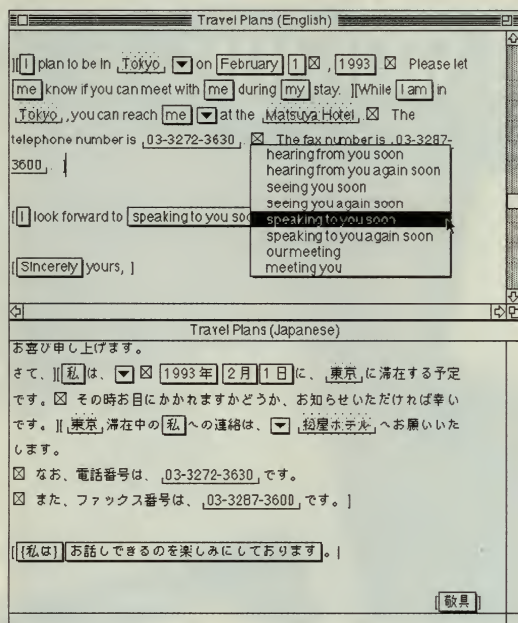
Belmont, Mass. — Language Engineering Corp.'s Ambassador attempts to bridge the language gap for English speakers doing business with Japanese companies.

The \$295 program, which shipped in January, lets English speakers compose correspondence in Japanese by selecting menu items and typing information in an English document.

Ambassador contains 200 letters and 450 templates, or letter elements, that it can translate into Japanese. A dictionary can translate often-used phrases, such as place names, products and businesses. Users who know some Japanese can add their own entries to the dictionary.

The program includes letters for many types of business correspondence, including complaints, billing, travel arrangements and orders.

"Before this, we had Japanese-literate employees translate everything," said Gary Rust, president of Concord International in St. Louis. "It makes a very good impression to send documents in Japanese, even if the recipient can read English."



Ambassador can be viewed in either English or Japanese; it comes with manuals in both languages. This allows Japanese users to utilize the same software to translate correspondence into English, the company said.

The software requires Version 6.0.5 or later of KanjiTalk, Apple's

Japanese operating system, to print and display Japanese.

The company said it is developing English-French and English-Spanish versions as well.

Language Engineering Corp. is at 385 Concord Ave., Belmont, Mass. 02178. Phone (617) 489-4000; fax (617) 489-3850. □

Language Engineering's Ambassador gives businesses a way to translate simple correspondence, such as this travel arrangement, into Japanese. The program contains pull-down menus that allow users to insert common phrases into a letter template. Users can draw on the 200 pre-formatted letters or build their own letters with the system.

Compton's rolls DOS, Windows, Mac, Sony formats onto single CD

M.O.S.T. discs work with multiple OSes

By Kirsten L. Parkinson

Carlsbad, Calif. — Compton's NewMedia Inc. last month announced that it will consolidate the Mac, DOS, Windows and Sony multimedia-player versions of its CD-ROM titles into single discs that can be read on all four platforms.

The company's Multiple Operation System Technology (M.O.S.T.) will include four separate browsing applications, one for each platform, that automatically access those files that are compatible with the platform's operating system.

Data that can be read universally by all four platforms, such as text and retrieval information, will be included only once on each disc. Information types that require a platform-dependent format, such as sounds, pictures and

animation, will be included on the CD-ROM in all four formats; each platform's browser will automatically load the correct format for that environment.

The company said it is aiming M.O.S.T. at both vendors and users. With four formats on a single disc, vendors will have space to stock more titles, and users will not have to worry about purchasing the right version of a disc for their systems.

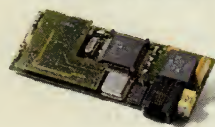
The first M.O.S.T. discs, to be released this month, will work on only DOS, Windows and Sony systems; Mac compatibility will be added to selected titles in April.

The four-format discs will be priced similarly to the previous versions, which contained only one format per disc. The company's CD-ROM prices range from \$24.95 to \$395.

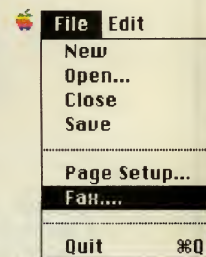
Compton's NewMedia Inc. is at 2320 Camino Vida Roble, Carlsbad, Calif. 92009. Phone (619) 929-2500; fax (619) 929-2577. □

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n Dimensions updates interface builder

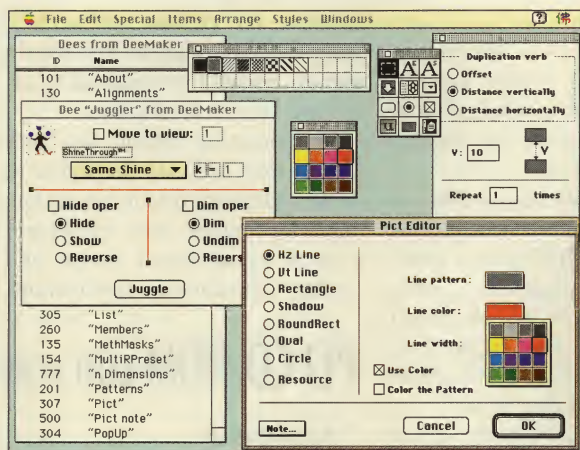
By Matthew Rothenberg

Aptos, Calif. — n Dimensions last month shipped an upgrade of DeeMaker for DeeManager, its Mac interface-development tool.

The DeeManager resource manager is A-Trap-based and compatible with all programming environments and languages, the company said. It uses high-level, object-oriented tools to implement the interface elements created with the DeeMaker resource editor. "Dee"-type resources generated by DeeMaker can include such diverse data types as dialogs, interactive windows, help balloons, PICT graphics and text.

According to n Dimensions, DeeManager supersedes much of the Mac Toolbox by providing faster, easier resource management. It also offers new interface tools such as ShineThrough, a feature that lets programmers swap up to 32 layers of interface elements. Developers also can create style sheets and apply them quickly to interface elements.

DeeMaker for DeeManager 1.2, available now for \$299, extends the software's resource-creation tools



DeeMaker for DeeManager provides high-level object-oriented tools designed to simplify the creation and management of Mac interface resources.

with new enhancements such as scrolling frames, multiple styles per text item, support for any type of list structure and three new windoid frames. Styles now can include more attributes, and the style sheet supports 16 additional styles. Version 1.2 also includes a preview mode for viewing and testing resources.

Joe Zuffoletto, president of Zuffoletto & Co. of San Francisco, said he has used DeeMaker for DeeManager with Apple's MacApp, ACI US Inc.'s 4th Dimension and Symantec Corp.'s THINK Pascal

to create data-entry screens for his company's client-server applications. The Dee resource format is "very rich," he said. "It pulls together a lot of elements of the Mac Toolbox into one convenient place."

"DeeMaker has a really nice palette of interface features," Zuffoletto said. "I can put together a human interface faster than I can using MacApp's tools, for example, and it'll be nicer."

n Dimensions is at 7000 Soquel Drive, Suite 403, Aptos, Calif. 95003. Phone and fax (408) 662-9703 or (800) 462-9777. □

Aperion eases creation of 4D add-ons: X-Step writes, tests in same environment

By Robert Hess

Mission Viejo, Calif. — Development of add-ons for ACI US Inc.'s 4th Dimension may be easier with a new tool from Aperion Inc.

With X-Step for 4D, announced last month, developers write externals using Symantec Corp.'s THINK C programming environment and test the externals using both 4D's and THINK's debuggers in tandem. This permits source-level debugging with shared variable names and contents. Previously, developers had to switch between the THINK shell,

where they wrote code, and the 4D environment, where they tested it.

The \$229 package comes with a shell for development of externals as well as a new 4D external header file. Examples for passing data between 4D and C are included. ACI US' 4D External Kit is not required.

Aperion said Version 2.0, due this month, will fully support 4D 3.0 callbacks and THINK Pascal.

Aperion Inc. is at 23332 Madero Road, Suite J, Mission Viejo, Calif. 92691. Phone (714) 458-7000 or (800) 727-6347; fax (714) 583-1249. □

Relax to ship optical drive for less than \$1,000

Union City, Calif. — Relax Technology Inc. this week will ship an optical drive priced at less than \$1,000.

The Sierra MO, a 3.5-inch 128-Mbyte rewriteable optical disk drive, sells for \$999. Relax is bundling the drive with On Location, a \$129.95 file-finding utility from ON Technology Inc. of Cambridge, Mass.

The Sierra MO is based on a Pana-

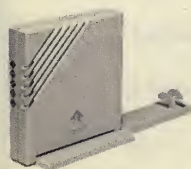
sonic mechanism that offers an average seek time of 33 milliseconds and a data transfer rate of 563 Kbytes per second.

It ships with an external power supply and one 128-Mbyte disk; additional cartridges are \$39 each.

Relax Technology Inc. is at 3101 Whipple Road, Union City, Calif. 94587. Phone (510) 471-6112; fax (510) 471-6267. □

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Scanner vendors bundle text-management apps

By Matthew Rothenberg

Irvine, Calif. — Software bundles from Mustek Inc. and Fujitsu Computer Products of America Inc. will help users of their desktop scanners get a handle on optical character recognition and document-image management.

► **Mustek Inc.** last month started shipping Mac optical character recognition software with the MFS-6000CS, its \$1,295 flatbed scanner, as well as with its \$599, 18-bit-color Langelo Color and \$359, eight-bit gray-scale Langelo Gray handheld models.

The MFS-6000CS comes with TextPert 3.5 from CTA Inc. of New Haven, Conn. The MFS-6000CS, based on a Microtek engine, captures color images at 600 dpi in three passes.

The Langelo handheld line now comes with CTA's ScanReader, a lower-end OCR package that juxtaposes successive scanner passes when reading text; ScanReader is no longer available as a retail package. The Langelo Color and Lan-

gelo Gray have maximum resolutions of 400 dpi and 800 dpi, respectively; both feature a scanning width of 4.13 inches.

► **Fujitsu Computer Products of America Inc.** this week will ship a \$2,495 bundle comprised of its \$2,095 ScanPartner 10 and Optix 4.0, a \$695 document-image-management program from Blue-ridge Technologies Inc. of Flint Hill, Va. Optix stores and retrieves scanned documents using OCR and auto-indexing; it supports multi-user access to image databases stored on an AppleShare server.

ScanPartner 10 is a 300-dpi monochrome flatbed device based on an AVision engine; it can capture an 11-by-14-inch image in five seconds.

Mustek Inc. is at 15225 Alton Parkway, Irvine, Calif. 92718. Phone (714) 833-7740; fax (714) 833-7813.

Fujitsu Computer Products of America Inc. is at 2904 Orchard Parkway, San Jose, Calif. 95134. Phone (408) 432-6333 or (800) 626-4686; fax (408) 894-1706. □

MicroCode ships circuit-simulation program

By Raines Cohen

Orem, Utah — MicroCode Engineering last month shipped CircuitMaker 3.0, a new version of its schematic capture and digital-simulation program.

The \$200 application includes a library of electronic devices, including TTL and CMOS devices, gates, flip-flops, display devices, a pulse generator, resistors, capacitors and inductors. Users can create their own devices, add them to the library and use them in their circuits.

Users draw lines between circuit components and use tools to trace circuit operation, simulate an oscilloscope or perform other analyses. Users can save the circuit and waveforms as PICT files or print them.

Version 3.0 adds a redesigned user interface. Other new features include unlimited-length styled text in labels, Clipboard support, an undo command and some new devices.

"I just use [CircuitMaker] to lay out circuits and run some simulations for personal use," said John McDaniel, software engineer at Phillips Semiconductor, a division of Phillips Corp. in Albuquerque, N.M. "The

interface [in Version 3.0] is much more consistent with the Mac than in earlier versions, the simulation is better, and I can set break points."

An upcoming version, due later this quarter, will add the ability to export schematic data in net list format, for import into third-party printed circuit-board design and analog simulation applications.

DOS and Windows versions are also under development for release this spring, the company said.

Current users can upgrade for \$50. Educational pricing and site licenses are available.

MicroCode Engineering is at 1943 North 205 West, Orem, Utah 84057. Phone (801) 226-4470; fax (801) 226-6532. □

PLI CD-ROM can run Apple Photo Access

By April Streeter

Fremont, Calif. — PLI last month shipped an external CD-ROM drive that has a speedier spin rate for nonaudio data and is compatible with Eastman Kodak Co.'s Photo CD disks.

The \$969 PLI CD ROM MS 200 sports a Toshiba mechanism and ships with PlayCD, HyperCard software that lets users play audio CDs from desktop Macs equipped with external speakers.

Dual-speed drives such as PLI's are currently the industry's fastest. They read data at a rate of about 330 Kbps but have an automatic

switching mechanism to slow down to 150 Kbps when handling audio data signals.

PLI said its player averages a 200-millisecond access time. In addition to Photo CD and audio discs, the player reads discs that use the IBM PC and compatible ISO 9660 and High Sierra standards. The company said the player works with the Apple Photo Access application, unlike some other third-party CD-ROM drives that support Photo CD.

PLI is at 47421 Bayside Parkway, Fremont, Calif. 94538. Phone (510) 657-2211 or (800) 288-8754; fax (510) 683-9713. □

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Applied slashes prices of accelerator cards

Dallas — Applied Engineering this month cut prices across its entire line of TransWarp 68030-based accelerator cards.

Reductions range from 11 percent to 40 percent. For example, the TransWarp CI without an FPU (floating-point unit) went to \$799 from \$1,265, while the TransWarp LC with FPU went to \$399 from \$513.

The Classic line now starts at \$349, down from \$499. The TransWarp SE now ranges from \$349 at 16-MHz with no FPU nor cache, to \$798 at 40-MHz with FPU and cache. Previously, the SE line ranged from \$412 to \$1,244.

The price of the recently introduced TransWarp 040 card remains the same.

Applied Engineering is at 3210 Beltline Road, Dallas, Texas 75234. Phone (214) 241-6060 or (800) 554-6227; fax (214) 484-1365. □

OEM drive from Toshiba

Irvine, Calif. — Toshiba America Information Systems Inc. last month announced its first 2.5-inch SCSI-compatible OEM drive.

The MK-2326F, based on a 2.5-inch Toshiba mechanism, will offer a 12-millisecond average seek time, maximum sustained data transfer rates of 3.8 Mbytes per second and an MTBF (mean time between failure) of 150,000 hours.

Designed as a portable drive for notebook users, the drive will offer three low-power modes: an idle mode in which the motor will spin but the read-write head will remain still; a standby mode in which the drive automatically will spin down after a set idle time; and a sleep mode that has not been configured.

The SCSI model of the drive will ship with OEM pricing of \$675 in the third quarter; a version with a PC interface will ship this month. □

GULF CD-ROM UPDATE



Minneapolis — Quanta Press Inc. last month released a Mac version of its Persian Gulf war CD-ROM. The \$69.95 USA WAR: Desert Storm includes text, images and sounds describing U.S. forces and the war. Users can copy materials into their own documents and print pictures and text directly from the disc.

Quanta Press Inc. is at 1313 Fifth St. S.E., Suite 223A, Minneapolis, Minn. 55414. Phone (612) 379-3956; fax (612) 623-4570.

Semaphore templates for FileMaker add interactive address checking

By Raines Cohen

Aptos, Calif. — Semaphore Corp. last month made it easier for FileMaker users to tap into ZP4, its CD-ROM-based application that standardizes mailing lists and adds postal ZIP+4 codes to addresses.

The CD-ROM can reparse addresses to resolve ambiguities. Users can interactively check addresses, run ZP4 in batch mode or integrate the program with their databases (see MacWEEK, Nov. 5 and Dec. 17, 1991, and May 4, 1992).

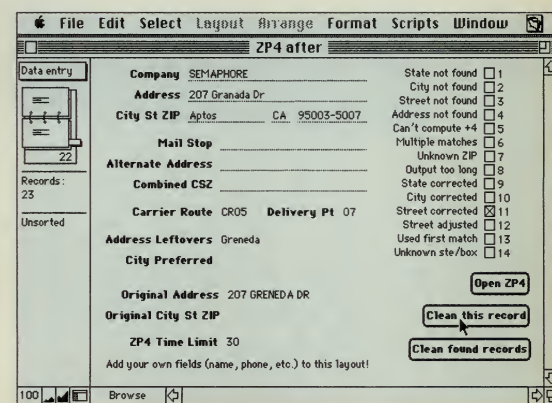
The latest edition includes templates for Claris Corp.'s FileMaker Pro 2.0 that use Apple events to communicate with ZP4, so addresses can be checked and ZIP+4 codes determined as they are entered, rather than in a time-consuming batch process requiring ASCII text export and import of the data.

Previously, the Apple event-based interactive checking capabilities were available only with high-end databases, such as ACI US Inc.'s 4th Dimension, that supported custom

externals to perform the interapplication communications.

ZP4 sells for \$125 per quarter. Each \$125 disc is valid for a three-month period, which satisfies U.S. Postal Service requirements that address data be current.

Semaphore Corp. is at 207 Granada Ave., Aptos, Calif. 95003-5007. Phone (408) 688-9200; fax (408) 662-2717. □



Semaphore's FileMaker Pro templates communicate with ZP4 through Apple events to automatically clean up addresses and add ZIP+4 codes as records are entered.

Sum Total to include color-calculation features

By Ian G. Jacobs

Mesa, Ariz. — Concurrent Engineering Tools Inc. next month will ship a technical-calculator program called Sum Total that has features aimed at programmers, engineers, scientists and graphic designers.

Users will be able to activate the floating palette, a system extension, with the press of a user-defined key from within any application.

The \$99.95 calculator will include color-calculation features, with an eyedropper tool that can analyze on-screen colors and mix values. Programmers will be able to take advantage of the calculator's ability to display values in two formats at once, including

binary, octal, hexadecimal and ASCII text.

Sum Total users will be able to create symbolic register names, so, for instance, a sales-tax rate could be referred to as "TaxRate" rather than as a cryptic memory register-number code.

Users will be able to choose between reverse-polish and standard notation for command entry. Other applications will be able to control Sum Total's functions through core Apple events.

Concurrent Engineering Tools Inc. is at 1115 N. Delmar St., Suite B, Mesa, Ariz. 85203. Phone (602) 464-8208; fax (602) 898-3844. □

Hitachi color monitors offer auto-scan

By Nathalie Welch

Montvale, N.J. — Hitachi America Ltd. this month shipped the Accuvue Premier Series, a line of color auto-scan monitors.

The line includes three 21-inch monitors, each of which offer a flat screen for reduced glare and a 0.28-millimeter dot pitch. They include the \$3,395 Accuvue PS-21AM, the \$3,295 Accuvue PS-21A and the \$2,995 Accuvue PS-21. The line's 20-inch monitor, the Accuvue PS-20, has a 0.31-millimeter dot pitch and sells for \$2,495.

All monitors conform to Swedish safety standards for extremely low frequency and very low frequency emissions, the company said. While the PS-20 and PS-21 feature Hitachi's Accufine screen coating, the PS-21A features an anti-reflective panel, and the PS-21AM boasts anti-

static coating compliant with both magnetic and electric-field standards.

The displays sport front-panel controls for a variety of image adjustments, as well as seven factory presets and 13 programmable presets for ease of switching between graphic modes and a three-color temperature selector.

All monitors offer Mac-supported pixel resolutions ranging from 640 by 480 pixels with a screen refresh of 60 Hz to 1,152 by 870 pixels with a screen refresh of 75 Hz. The highest possible resolution supported is 1,600 by 1,280 pixels, with a screen-refresh rate of 60 Hz.

Hitachi America Ltd.'s Office Automation Systems Division is at 110 Summit Ave., Montvale, N.J. 07645. Phone (201) 573-0774; fax (201) 573-7660. □

Optquest lowers prices on noninterlaced monitors

By Nathalie Welch

Walnut, Calif. — Optquest Inc. this month dropped prices on its entire line of noninterlaced monitors, with cuts as high as \$296.

All of the displays have 1,024-by-768-pixel resolution and tilt-and-swivel bases. All have a 72-Hz screen-refresh rate except the model 4000DX, which has a refresh rate of 76 Hz.

The price changes cover:

► **14-inch.** The Optquest 1000S, with a

0.28-millimeter dot pitch, was reduced by \$86, to \$409; the Optquest 1000D, with a 0.26-millimeter dot pitch, was reduced by \$96, to \$449; and the Optquest 1500D, also with a 0.26-millimeter dot pitch, was reduced \$96, to \$499.

► **15-inch.** Both flat square-screen moni-

tors, the Optquest 2000D and the Optquest 2000DX, were reduced by \$246, to \$649.

► **17-inch.** Also featuring a flat square screen, the Optquest 4000D, with a 0.28-millimeter dot pitch and a 76-Hz refresh rate, was dropped \$296, to \$1,199, while the Optquest 4000DX, with a 0.31-millimeter dot

pitch and a 72-Hz screen refresh, was reduced \$246, to \$949.

All but the Optquest 1000S have microprocessor-based controls, and all but the 1000S, 1500D and 4000DX conform to Swedish safety standards for extremely low frequency and very low frequency emissions, according to the company.

Optquest Inc. is at 20490 E. Business Parkway, Walnut, Calif. 91789. Phone (909) 468-3750; fax (909) 468-3770. □

Working Software adds speller to 4D apps

By Robert Hess

Santa Cruz, Calif. — Users of ACI US Inc.'s 4th Dimension database finally can dot their i's and end the tease with the release of Working Software Inc.'s OEM Spellswell External for 4D Developers.

Working Software's external package adds a spell-check command to 4D's programming language. The command interactively checks a field's contents. Spellswell also checks proof-reading errors, including double words, punctuation, a/an usage and improper hyphenation.

The spelling checker is the same as that built into Working Software's QuickLetter, ExpertWriter and Resume Maker.

The external package is licensed to developers for \$250 per application, which allows an unlimited number of sites and users.

ACI has sold in France for some time a spell-checking module for 4D and was preparing to release one in the United States this quarter. However, the company said it will evaluate the reception Working Software's product receives before proceeding.

Working Software Inc. is at P.O. Box 1844, Santa Cruz, Calif. 95061-1844. Phone (408) 423-5696 or (800) 229-9675; fax (408) 423-5699. □

CD-ROM teaches leadership skills

Duluth, Ga. — PERC Macromedia Group Inc. is attempting to impart the same leadership skills taught at business seminars with an interactive CD-ROM for the Mac.

The \$195 People Who Lead People CD-ROM contains eight hours of simulations, training materials, exercises, tests and management-education programs aimed at executives, managers and business owners.

Topics include improving employees' work habits, holding effective meetings and maintaining improved performance. Other sections teach labor law, how to deal with government regulations and safety observation techniques.

The CD-ROM includes business-decision simulations, on which users are scored, and a database to compare those scores with national averages.

PERC Macromedia Consulting Group Inc. is at 4774 Bogie Road, Duluth, Ga. 30136. Phone (404) 447-1876; fax (404) 416-6567. □



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■ Using **NetAccess™**, our AppleTalk-to-IBM midrange gateway, the City of Oakland can remotely access data on budget development, project planning, financial management, taxes, and executive MIS from three midrange hosts.

■ Grimes Aerospace is using **TCPAccess™**, 5250 emulation software to link Macintosh to the AS/400® through a TCP/IP network for terminal services and file transfer. The result is accessible IBM data with point-and-click ease using Mac spreadsheet and desktop publishing programs.

■ Grand Forks Public Schools consider Andrew a class act—we helped link its Mac network to the AS/400 using **Token Access-Client™**. Now 13 schools achieve 5250 terminal emulation through an AS/400

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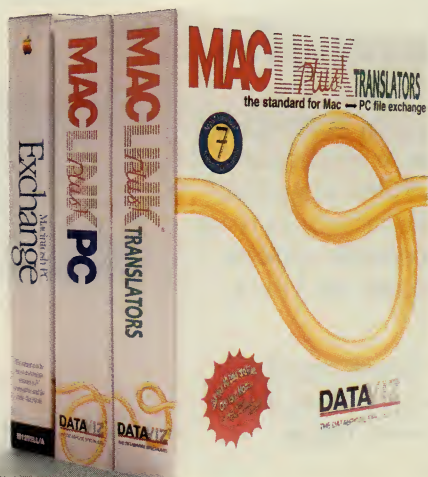


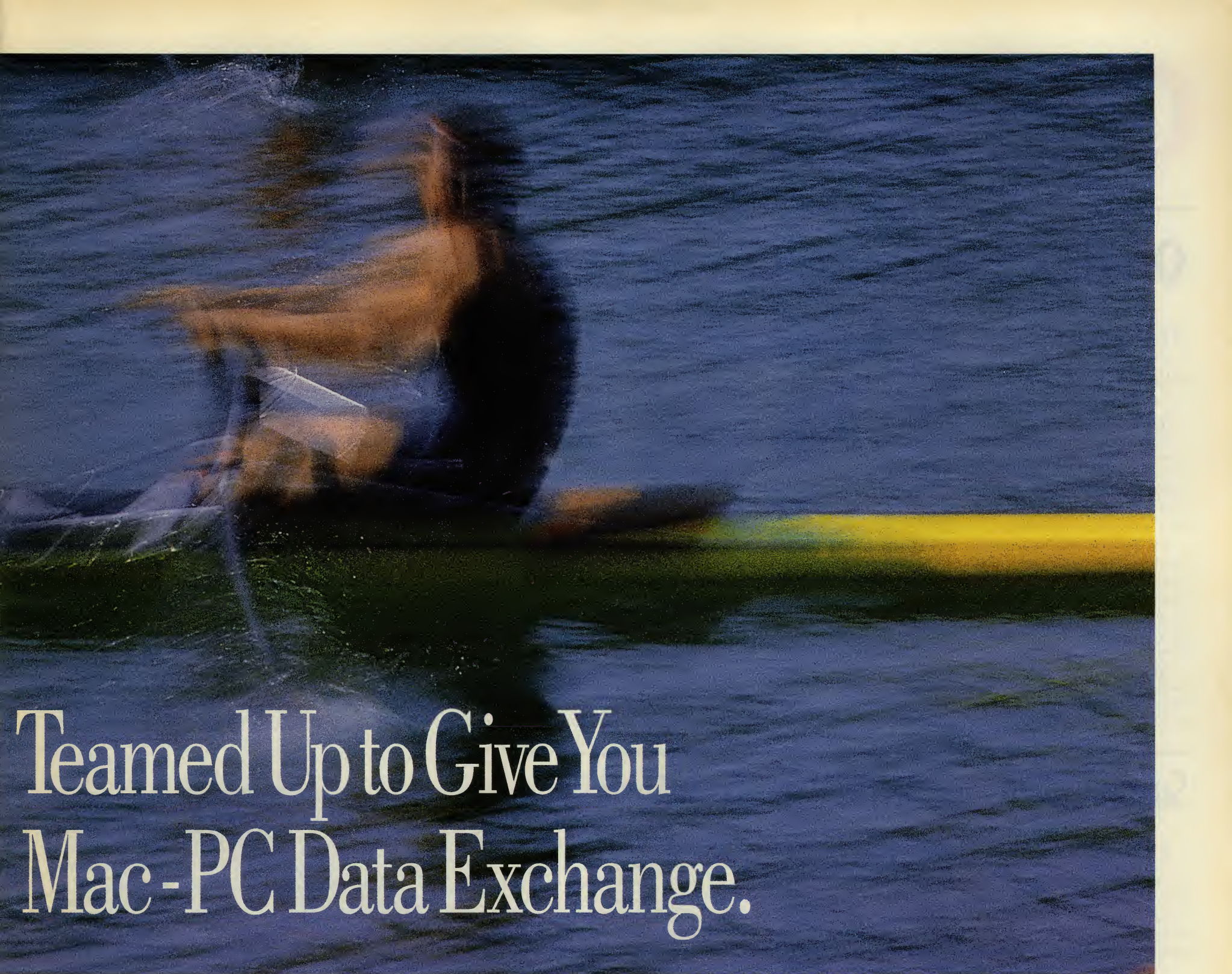
DataViz and Apple Have the Most Powerful Solution for

It takes real teamwork to get any job done these days, especially if you're dealing with incompatible Macintosh and PC files. That's why DataViz has teamed up with Apple to add even more utility to MacLinkPlus™. It's the most muscle ever assembled to overcome your toughest file translation problems between Macs and PCs.

For years, MacLinkPlus has set the standard for ease of use. And thanks to two new Apple products, what was once easy is now practically effortless. We now include Macintosh PC Exchange™ and Macintosh® Easy Open with every package of MacLinkPlus we ship. Macintosh PC Exchange makes DOS disks appear on the Mac desktop and shows their contents as Macintosh files and folders. New Macintosh Easy Open is a System 7™ extension that helps you open Mac or PC files when the application that created them isn't on your Mac. These technologies from Apple teamed with our translators offer the most complete solution to file transfer and translation available in a single package. MacLinkPlus contains over 700 conversion paths to and from all

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Oracle7 to offer multimedia tools

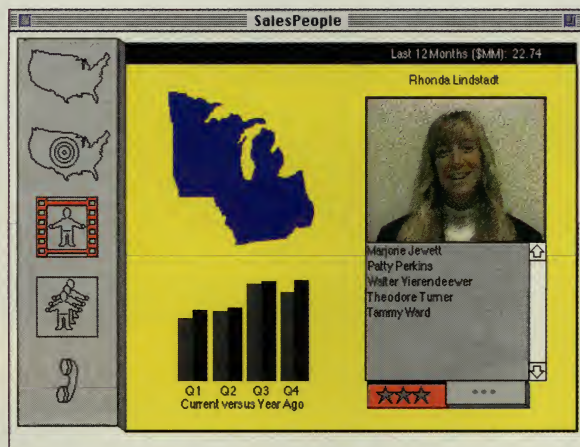
Mac Oracle Card supports QuickTime

By Mitch Ratcliffe

San Francisco — Oracle Corp. next month will introduce development tools and extensions for its Oracle7 relational database that will allow Mac users to build multimedia database front ends on several platforms.

The company last week shipped a QuickTime-compatible version of its Oracle Card for Macintosh front end. The company said the product will be the first in a series of new tools and extensions known as Cooperative Development 7 (CDE7).

Applications built with CDE7 tools will be portable across Mac, Windows and X Window system platforms. Lawrence Ellison, Oracle



Oracle Card for Macintosh 1.1 adds support for QuickTime-movie objects within Oracle database clients.

president and CEO, said at a meeting here that the company will deliver the new CDE7 tools by June.

Multimedia extensions that will let Oracle7 database client applications play QuickTime and other video clips, as well as audio files, are

also due in the spring, Ellison said.

He said Oracle's distributed-server capabilities, combined with the CDE7 tools and extensions, will help support desktop and mobile-computer access to massive libraries

See Oracle, Page 18

Coactive devices allow Macs, PCs to communicate via AppleTalk

By April Streeter

Belmont, Calif. — Coactive Computing Corp. wants to make Mac-style networking for small, heterogeneous workgroups as simple as, well, Mac-style networking.

In April, Coactive plans to ship two \$149 boxes, Connector for DOS and Connector for Windows, which let IBM PCs and compatibles communicate with Macs via LocalTalk. Each two-port box has its own 32-bit processor and enough ROM to hold the AppleTalk protocol stack.

For the Mac and other LocalTalk devices, Coactive will sell a small, \$29 v-shaped connector similar in function to Farallon Computing Inc.'s PhoneNET adapter but with two terminated ports.

To set up a PC and Macintosh network, PhoneNET or Coactive Connectors must be hooked to the

LocalTalk ports of the Macs, while the parallel ports of the PCs receive the larger Coactive Connectors. Nodes are wired together with unshielded twisted-pair cabling, like PhoneNET. Coactive networks can have up to 32 nodes in any combination. Additional printers may be added through the large Connector's parallel port.

Coactive's PC software has a barebones three-step installation process and is compatible with DOS 3.1 and above, as well as all incarnations of Windows.

Macs access shared files through the Chooser. PCs see shared files in volume directories, and Windows users access them through the File Manager.

"With file and print services similar to [Novell Inc.'s] NetWare Lite, See Coactive, Page 18

Santorini adds management muscle to AppleShare

By Leonard Heymann

San Francisco — Network administrators frustrated by the dearth of AppleShare remote-management capabilities may find relief in a new product from Santorini Consulting & Design Inc.

Server Manager, which shipped last week for a single-server price of \$395, lets administrators monitor and control multiple AppleShare 3 servers from a single location. Through software extensions that run on server machines, users can

perform AppleShare Admin functions remotely, receive alerts and record server activity.

Server Manager lets administrators configure the accounts of any AppleShare file server, among other Admin activities, from their own Macs. It also can detect problems such as backup failures, excessive server activity and impending disk-space shortages.

Administrators can receive alerts via dialog boxes, sounds or Notify! paging messages from Ex Machina Inc. of New York. Server Manager

also was slated to check for viruses on servers via Symantec Corp.'s Symantec AntiVirus for Macintosh 3.0; that capability will now come in a later release, according to Santorini.

"I think it's great because it let me take off [Farallon Computing Inc.'s] Timbuktu and keep the server locked up," said Warren Strand, MIS manager for Microwave Applications Group, an electronics manufacturer in Santa Maria, Calif.

Strand said the added management capabilities, such as the alerts and activity log, have been particularly useful. "With normal AppleShare software, there's almost no way of finding out who's logged onto the system," which poses a challenge in maintaining security, he said.

Peter Haase, network manager at Los Alamos National Laboratory in Los Alamos, N.M., said he's so confident in Server Manager's capabilities that he will remove the monitors and keyboards from his two Quadra 950 servers. He has also added users to the network from home because Server Manager works across AppleTalk Remote Access connections.

Server Manager costs \$695 for a five-server pack, \$995 for 10 servers and \$1,495 for 20 servers.

Santorini Consulting & Design is at 2147 Union St., Second Floor, San Francisco, Calif. 94123. Phone (415) 563-6398; fax (415) 563-0332. □



Coactive Computing's Connector for DOS and Windows computers has two LocalTalk ports (A); an external power supply (B); and two parallel ports (C), one to hook into the PC and another for a printer.

Mac LAN Server client ships

By April Streeter

Armonk, N.Y. — IBM Corp. planned to ship late last week a Mac client for its OS/2-based file server.

The \$995 LAN Server for Macintosh makes Macs capable of sharing files and printers on an OS/2 server running Version 3.0 of LAN Server. IBM developed the client software with Miramar Systems Inc. of Santa Barbara, Calif.

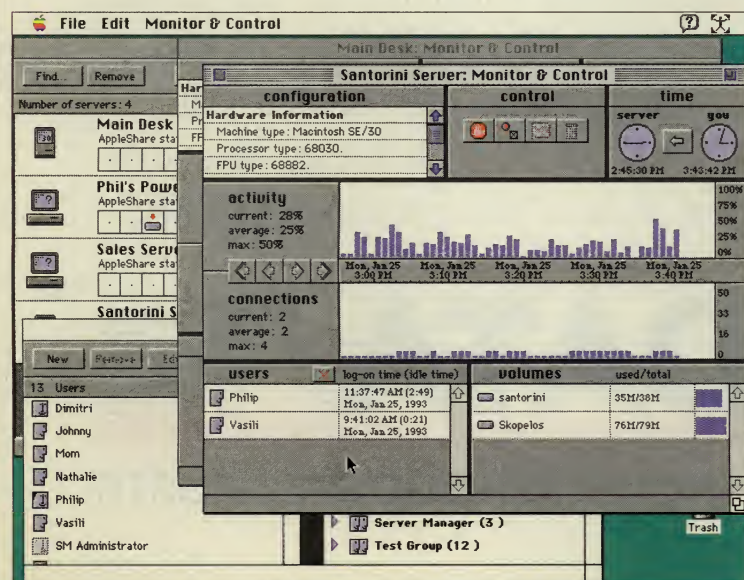
LAN Server for Macintosh turns the OS/2 server into an AFP (AppleTalk Filing Protocol) server. A server administrator can assign eight-character encrypted or non-encrypted passwords.

Aside from file sharing, Mac and IBM PC and compatible clients spool print files to the server, which redirects jobs to as many as nine laser printers attached to the network.

IBM's other Mac client software offering is the \$995 Workstation One for Macintosh, a file- and printer-server client with additional terminal-emulation features, which runs over TCP/IP networks. The software requires Apple's MacTCP to connect Macs to LANs served by Novell Inc.'s NetWare, Microsoft Corp.'s LAN Manager or IBM's LAN Server using their respective TCP/IP add-ons.

Workstation One lets Mac and Windows users share files as well as run terminal emulation of Digital Equipment Corp.'s VT series, Tektronix Inc. terminals and IBM's 3270 series.

IBM Corp. is at Old Orchard Road, Armonk, N.Y. 10504. Phone (800) 967-5663 for Workstation One and (800) 342-6672 for LAN Server. □



Santorini's Server Manager lets administrators add, delete and modify user accounts on multiple AppleShare 3 servers from a single desktop.

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AsantéView management software. The most affordable health care for your network.

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Together they give you a network management system offering 16 performance-monitoring statistics, network health meters, and direct control at the hub and port levels. All from your choice of a Windows® PC or Apple® Macintosh® management station.

It's easy to monitor your network's vital signs.

The system gives you even greater control with unique alarm thresholds to warn you when unacceptable traffic or error levels occur. And can even trigger your pager before a problem arises on your network so you can administer a little preventive medicine.

AsantéView in-band network management software supports the widely

accepted Simple Network Management Protocol (SNMP), and can automatically draw a map of your network which simplifies the learning and administering of IP addressing.

AsantéView out-of-band management software is just as powerful as the in-band software, and uses the same GUI. By plugging your network management station directly into the RS-232 port, or by using a dial-up modem, you can simultaneously manage up to 12 AsantéHubs from anywhere you have access to a telephone.

No one takes care of networking like Asanté.

The Asanté network management system is the heart of our complete family of networking products. So if you're looking for a single source for all your departmental networking solutions, Asanté is just what the doctor ordered.

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Resellers: Asanté products are available from Ingram Micro, Tech Data, and Merisel.

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Spider Island expands TeleFinder BBS

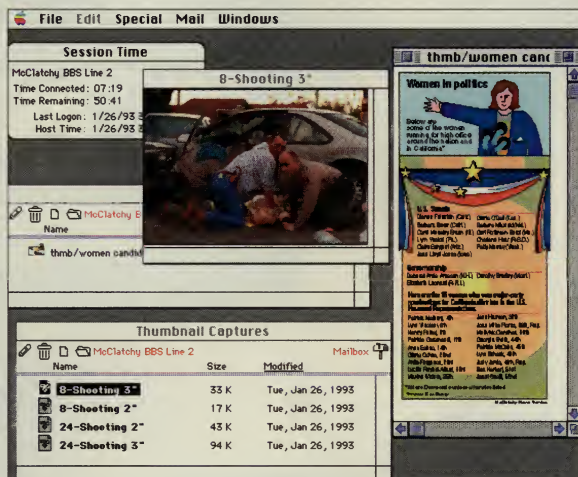
*Version 3.0 features
based on Apple events*

By Nathalie Welch

Irvine, Calif. — Spider Island Software is shipping an upgrade of its bulletin board system featuring expanded support for Apple events and a new multiserver architecture.

TeleFinder is a Mac-based graphical bulletin board system with its own client software. TeleFinder Group Edition 3.0, priced at \$425 and available now, includes a BBS host program and unlimited client software. Upgrades from previous versions are \$65 or free if downloaded from Spider Island's own BBS.

Expanded compatibility with Apple events lets the BBS' four application programs, the Node Server, User Manager, Caller Log and Transfer Log, work together to provide features such as automatic on-line registration and remote management of user accounts. Remote management can occur over the LAN using Spider Island's \$149 NetConnect software, needed to set



TeleFinder Group Edition's upgraded client software now lets users view PICT files and bit-mapped images.

up an in-house AppleTalk-based BBS, or by dialing in over a modem.

"It was always 32-bit-clean, but now it supports more Apple events for increased functionality," said Mike Skultety, system manager at Types Inc., a service bureau in Greensboro, N.C. Skultety uses the TeleFinder to provide shareware, font libraries and updates to his customers.

Administrators also now can control host program modules through any AppleScript-compatible system

utility such as UserLand Software Inc.'s Frontier.

TeleFinder 3.0's multiserver architecture allows a single BBS to run on separate networked Macs, greatly increasing the number of telephone lines the BBS can support.

TeleFinder 3.0 also provides users with a menu-driven terminal interface containing unlimited levels of user access, customizable color icons and separate user privileges.

TeleFinder User, the bundled client program, now can be used to view PICT files in addition to bit-mapped files and has an improved auto-dial feature.

Spider Island Software is at 4790 Irvine Blvd., Suite 105-347, Irvine, Calif. 92720. Phone (714) 669-9260; fax (714) 669-1383. □

Apple ships DAL client software

By Leonard Heymann

Cupertino, Calif. — Apple this week will ship a retail version of its Data Access Language client software, though without the expected support for Microsoft Corp.'s Open Database Connectivity scheme.

DAL Client for Macintosh, priced at \$149, will be available from Apple dealers; previously, the Data Access Language (DAL) extension was bundled with System 7.0 and third-party database access products. Apple unbundled the DAL extension from System 7.1 last fall.

In an effort to increase sales of its

DAL products, Apple will soon begin selling retail versions of its DAL servers, the company said. Currently, DAL servers are available from APDA and third parties such as Pacer Software Inc. of Westborough, Mass.

Support for Open Database Connectivity (ODBC), which will let users access DAL databases directly from applications that comply with the ODBC specification, is due later this year, according to Apple.

The DAL Client for Macintosh is available in a 10-user version for \$1,043. Users also can pay \$119 for the right to make one copy. □

Oracle

From Page 16

of public information that will include text, faxes, graphics and video files.

Version 1.1 of Oracle Card is the first Oracle front end to support System 7 and QuickTime movies. When CDE7 QuickTime extensions ship, Oracle Card will be able to play a QuickTime movie that resides on an Oracle7 server. But in the meantime, the front end can be scripted to play a movie that can be stored on the client Mac or an AppleShare server.

When developers create a new QuickTime window in an Oracle Card front end, a database access

script is generated automatically. That script can be modified by developers to support front ends that display different movies, or text, depending upon the outcome of a query.

The \$699 application requires Oracle's SQL*Net connectivity extension. Runtime versions will operate on Macs or Windows workstations, but QuickTime support will not be added to Oracle Card for Windows until later this year. The runtime versions will cost between \$100 and \$300, depending on quantity.

Oracle Corp. is at 500 Oracle Parkway, Redwood Shores, Calif. 94065. Phone (415) 506-7000; fax (415) 506-7200. □

Coactive

From Page 16

the cost of this product is the clincher," said Devin Doherty, a Mac network consultant based in Newport Beach, Calif., who is considering Coactive's solution for some clients. "PC people definitely want that same easy-to-network environment already available to the Mac."

According to BIS Strategic Decisions Inc. of Norwell, Mass., the top three inhibitors to the growth of networks at small, mixed Mac and PC or PC-only sites is price, ease of installation and ease of use. Coactive said LocalTalk, despite its speed inferiority compared with Ethernet or token ring, is the right choice for these users.

Coactive decided to forgo password protection. Instead, each user is assigned a read-only folder that others can drop files into but not open.

Printers hooked directly to the network are available to all; a user with a printer connected through the large Connector's parallel port can choose to share or hide it.

Coactive Computing Corp. is at 1301 Shoreway Road, Suite 221, Belmont, Calif. 94002. Phone (415) 802-1080; fax (415) 593-9304. □



Gateways BRIEFS

EclecTec beefs up network simulator

Scotts Valley, Calif. — EclecTec Software Inc. this week is shipping a renamed and revamped version of its network simulation software. NetVirtual II 2.1 adds more than 50 routers to the library of devices that can be modeled in a simulated AppleTalk network. The initial version, called NetVantage II, supported only two software routers. EclecTec dropped the original name after discovering that another company already was using it.

NetVirtual II lets users create and test simulated network configurations to evaluate potential performance before actually laying cable. In addition to routers, the list of devices users can test includes servers, bridges, printers and workstations.

Under a new pricing structure, a base unit to construct models of up to 100 nodes costs \$995. Expanded capability can be added with 50-node packages priced at \$399.

EclecTec Software Inc. is at 269 Mount Herman Road, Suite 202, Scotts Valley, Calif. 95066. Phone (408) 461-2040; fax (408) 461-2044.

Digital Products gives SprintTALK/25E eight ports

Waltham, Mass. — Digital Products Inc. last week doubled the ports and dropped the price on its LocalTalk-to-Ethernet print server.

SprintTALK/25E now has eight ports for connecting AppleTalk printers or other devices, such as PowerBooks, to an Ethernet network via either a thin-net or 10BASE T connector. Based on a Motorola 68340 processor, the 25E runs at 16 MHz and is priced at \$545, a reduction of \$150.

Another version of the product, the SprintTALK/25T, provides the same eight LocalTalk ports for a token-ring network for \$995.

Digital Products Inc. is at 411 Waverly Oaks Road, Waltham, Mass. 02154. Phone (617) 647-1234 or (800) 243-2333; fax (617) 647-4474.

APS drops PowerBook modem price to \$69

Independence, Mo. — Seemingly intent on putting telecommunications in every PowerBook, APS Technologies Inc. last month further reduced the price on its APS PowerModem.

Now \$69, the 2,400-bps data modem lets users send and receive faxes at 9,600 bps. The device, which is compatible with the new PowerBook 160 and 180 models, originally shipped in December for \$129.

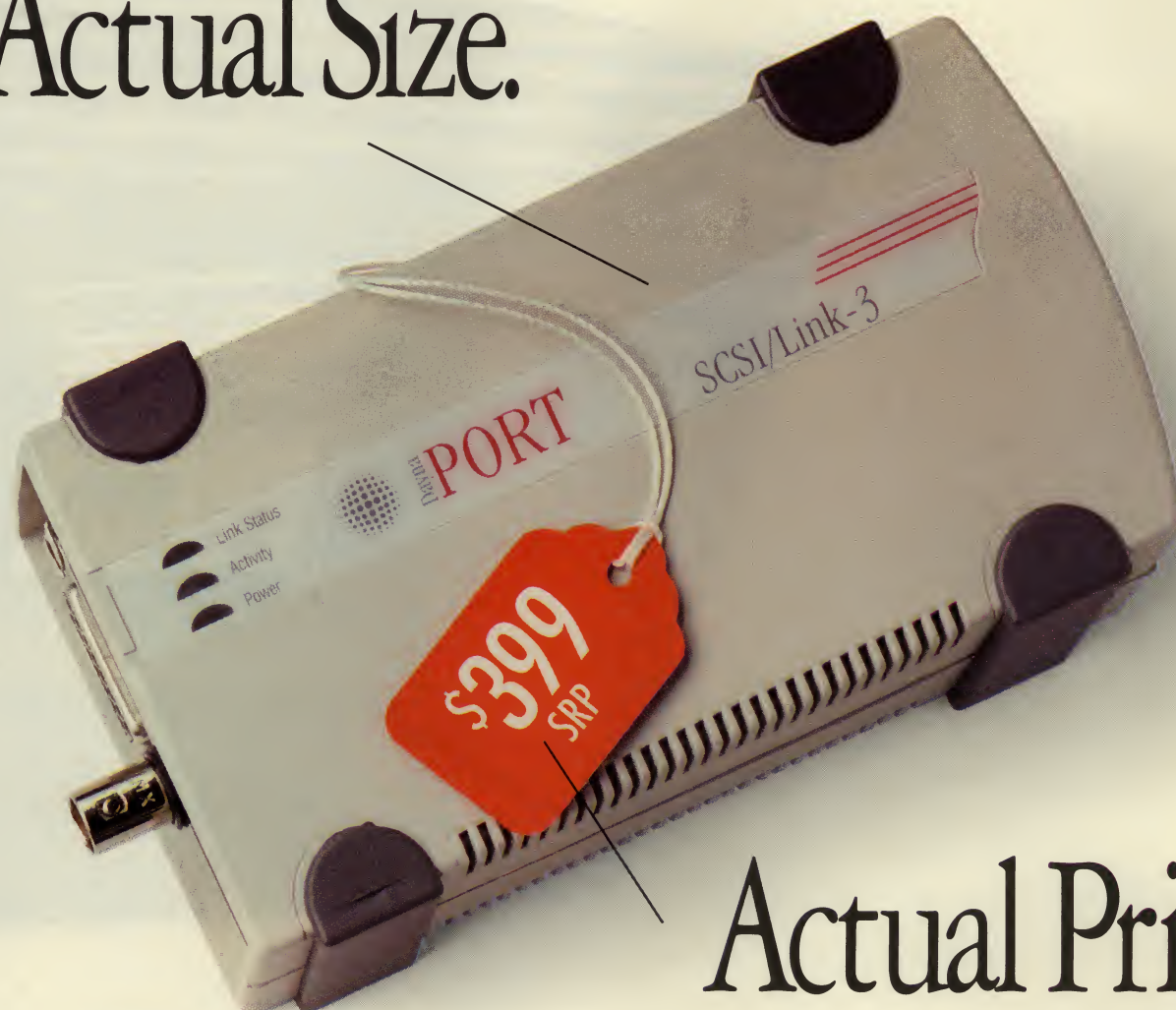
FAXstf fax software from STF Technologies Inc. and FreeTerm shareware data-communications software will be bundled with the modem.

APS Technologies Inc. is at 2900 S. 291 Highway, Independence, Mo. 64057. Phone (816) 373-5800 or (800) 235-2753; fax (816) 478-4596.

"The smallest, lightest SCSI Ethernet interface available for the Mac."

—MacUser, February 1993

Actual Size.



Actual Price!*

The editors of *MacUser* magazine said it best. DaynaPORT SCSI/Link is the smallest, lightest SCSI Ethernet adapter on the market today.

Macintosh SCSI Ethernet Adapter Comparison	DaynaPORT SCSI/Link	Asanté EN/SC	Focus EtherLAN SC
Dimensions	6" x 3" x 1.75"	8" x 4" x 1.5"	7.5" x 5.5" x 1.5"
Weight	13 oz.	24 oz.	25 oz.
Pass through SCSI	Yes	Yes	No
SCSI termination switch	Yes	No	No
3-in-1 models available	Yes	Yes	No
Autosensing Ethernet ports	Yes	No	No
Onboard SCSI controller	Yes	No	Yes
100% Apple SCSI compatible†	Yes	No	No
SCSI cable included	Yes	Yes	No
Warranty	Lifetime	5 years	5 years

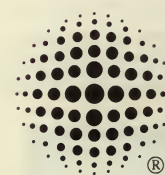
†Only SCSI/Link fully implements the IEEE SCSI specifications without modifying the Apple SCSI Manager.

But don't just try us for our size. Compare us feature for feature with our competition and you'll see that we've packed a whole lot of value into a very small product. SCSI/Link includes two SCSI ports and a handy termination switch, so it's easy to connect anywhere in your SCSI chain. And unlike our competitors, we designed our product to be fully compatible with Apple's SCSI Manager, for maximum reliability and compatibility with all Macintosh models.

Add to that our reputation for quality engineering design and manufacturing, our superb technical support and our no-nonsense lifetime warranty, and

you simply won't find a better, safer buy from anyone else in the industry.

MacWEEK Macintosh Volume Buyers (MVBs) take note. You can try SCSI/Link FREE OF CHARGE for 30 days. Just call us today at 1-800-44DAYNA and ask about our *MacWEEK* MVB evaluation program.



Dayna

Macintosh Networking Specialists

* Actually, actual prices (street prices) for all our products are typically about 25% to 30% less than retail. Check with your favorite reseller for current prices.

DaynaPORT SCSI/Link is a trademark of Dayna Communications, Inc. All other product names are the trademarks of their respective holders. © 1993 Dayna Communications, Inc., 50 South Main, 5th Floor, Salt Lake City, Utah 84144. (801) 531-0600 FAX: (801) 359-9135.





Cross platf

New Timbuktu is the easiest way to network Macintosh and Win

New Timbuktu for Windows 1.0

- Lets you connect to AppleTalk printers and AFP servers.
- You can "browse" network resources with a Windows "Chooser."
- High-performance file exchange and full 24-bit screen sharing.
- Supports over 25 network cards for Ethernet, LocalTalk & Token Ring.
- File name mapping between Macs and PCs.
- Multi-level password security.
- Supports memory managers including DOS 5.
- Extensive on-line help.
- Timbuktu for Windows PhoneNET® kit includes LocalTalk for ISA or MCA.



New Timbuktu for Macintosh 5.0

- High-performance file exchange and full 24-bit screen sharing.
- New connection documents automatically re-establish frequently used connections.
- Backward compatible with previous versions of Timbuktu.
- Dial-in support over Apple's AppleTalk Remote Access or Farallon's Liaison™ Internet Router. (Not included.)
- Multi-level password security.
- Takes full advantage of Apple System 7.
- Extensive on-line help, including Balloon Help.



Moving information between Macintosh® and Windows™ computers used to be quite a feat of skill. Let alone nerves.

But now there's Farallon's new Timbuktu® for Macintosh and Windows.

Timbuktu is the easiest way to create a cross-platform peer-to-peer network. So now, whether you're on a PC or Mac, you can share expensive peripherals like printers and file servers. And share or exchange files between cross-platform applications like word processors, spreadsheets and databases.



orms easily.

dows computers, so you can share printers, files and screens.

Plus, Timbuktu goes beyond basic network services, giving you a unique benefit—remote control. It can send a real-time, full-color picture of your screen over the network so you can control and view it from another Mac or Windows PC.

That means you can use your network for new things. Like collaboration and user support.

Of course, Timbuktu is easy to use and install. All you need is a copy of the software on each machine.



(Multi-packs are available.) There's no need for a dedicated gateway or server. So it's a cost-effective solution.

Since it's based on standards, Timbuktu works with what you've got. Including more than 25 ODI compatible network interface cards for Ethernet, LocalTalk and Token Ring. And it's the only cross-platform peer-to-peer

solution that can co-exist with other

server-based networks, so you still have access to corporate resources on AppleShare, NetWare or TCP/IP.

It's everything you'd expect from a company with more than seven years of experience and four million users.

See for yourself why Timbuktu is the easiest way to network Macs and PCs.

Call today. We'll send you a free full-color copy of our product guide. It's that easy. **1-800-949-7761.**



Research Report

Mac networks take all kinds

MacWEEK's
networking
survey found
most sites
had mixed
platforms
running a
diverse set of
protocols.

Networks composed solely of Macintoshes are the exception not the rule, according to the results of the latest MacWEEK survey of large Mac sites. The poll explored networking hardware and software usage, including file servers, multi-user databases, media and protocols, among 667 MacWEEK readers who had at least 50 Macs on-site.

Network profile. Of those surveyed, 95 percent said their organizations have networked Macs. On average, 83 percent of the total installed base of Macs are on networks, totaling on average 400 networked Macs at each location.

Nine in 10 respondents' organizations have Macs on multiplatform networks, either on- or off-site. The most common cross-platform connection is to mainframes: Six in 10 respondents have Macs tied to these large computers. About the same percentage report Mac-to-minicomputer links. Networks connecting Macs with IBM PCs and compatibles are found at 55 percent of the surveyed organizations; 53 percent use Macs wired to workstations.

Only 8 percent of the large sites surveyed report Macs connected exclusively on all-Mac networks. However, some isolated Mac-only networks are present

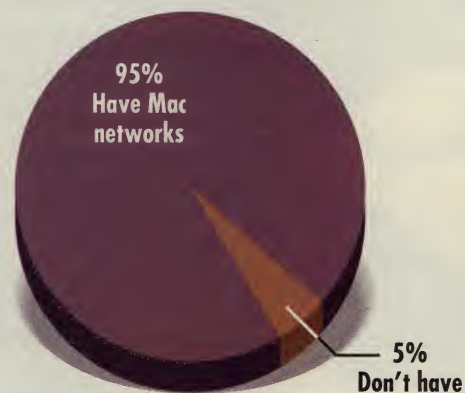
at half the sites that also house some heterogenous networks.

Network media. LocalTalk and Ethernet are by far the most widely used networking media, followed distantly by token ring and Fiber Distributed Data Interface (FDDI). Sites where Macs are networked with other types of computers, however, are more than twice as likely to use Ethernet than sites where Macs are wired only to other Macs. Token ring and FDDI also are much more common at multiplatform sites than at the Mac-exclusive sites.

More than half of the Mac-exclusive sites (54 percent) have only one type of network cabling in place, primarily LocalTalk. In contrast, nine in 10 sites where Macs are wired to Intel-standard micros use two or more different network media for their networks that contain Macs.

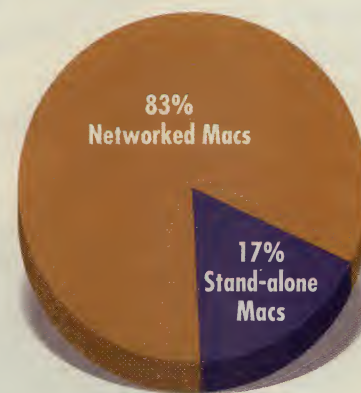
Network protocols. Multiplatform networks usually spawn diverse protocols. While AppleTalk is used at nine out of 10 sites that have networked Macs, 56 percent of the organizations surveyed also use TCP/IP. Thirty-six percent employ DECnet and 17 percent use IPX (Internetwork Packet Exchange), the protocol underlying Novell Inc.'s NetWare. The use of IPX is likely to grow in 1993, since

Sites with networked Macintoshes



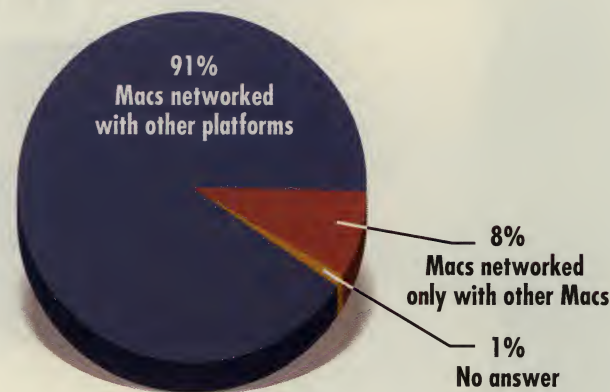
Base: Total respondents

Macs networked per site



Base: Have Mac networks

Sites with multiplatform networks



Base: Have Mac networks

CHARTS BY NEVIN BERGER

Types of Mac networks

Mac networks are connected to ...



Base: Have Mac networks

The MacWEEK 1993 Networking Study was sent by mail to 1,200 MacWEEK subscribers, selected on an ntb-name random basis from among those who work at sites with 50 or more Macs installed. All sites were located within the contiguous United States. Value-added resellers, resellers and consultants were excluded from the sample.

Market Probe International, an independent New York-based market research company, was responsible for all survey operations. Research procedures followed established market research standards. Each sample member received an eight-page questionnaire accompanied by a cover letter, a \$1 incentive and a stamped, self-addressed return envelope.

Fieldwork was conducted from October to December 1992, yielding a total of 667 completed questionnaires, for a 56 percent net response rate.

Novell plans to begin selling an IPX protocol stack specifically for Mac NetWare clients.

Not surprisingly, sites where Macs are networked only to other Macs are much more likely to run under one protocol (79 percent) than sites with Mac-to-Intel or Mac-to-mainframe connections (17 percent).

File servers. Almost all respondents have file servers. Nine in 10 use Macs as file servers for Mac clients, and 15 percent use Macs exclusively for this purpose. Mac II-series computers are used by two out of three organizations, followed in frequency by Mac SE/30s (35 percent) and Quadras (27 percent).

But most of the organizations surveyed use a variety of server platforms: Three-fourths have more than one computing platform as a server for Macs. On average, respondents have between two and three types. Sixty percent use PCs as servers for Macs; 486-based PCs are used most often (at 44 percent of sites with networks), followed closely by 386-based PCs (40 percent). More than four in 10 use Digital Equipment Corp. VAXes, while the same proportion use Unix-

based workstations or minicomputers. Nine percent use IBM Corp. AS/400s as Mac file servers.

Multi-user databases. Six in 10 respondents report the use of multi-user databases with Macs at their work locations. A wide variety of computers are used as hosts: The Macintosh is most common and is used at 69 percent of networked sites, followed by DEC VAXes (50 percent) and mainframes (45 percent).

Survey respondents report that Claris Corp.'s FileMaker is the most common multi-user database software used by Mac clients — 47 percent of networked sites have it in service. With just under half of sites using mainframe hosts, it is not surprising that Oracle Corp.'s databases showed strongly; 32 percent of the respondents have multi-user Oracle servers set up for Mac users. ACI US Inc.'s 4th Dimension tied Oracle's showing, and Microsoft Corp.'s FoxBASE is the third most popular shared database, with 24 percent of sites.

Where Macs currently do not tap multi-user databases, about one-third said it is "likely or very likely" that such access will be implemented at their sites within the next 12 months. □

Large Mac sites make heavy use of non-Mac multi-user databases

Multi-user databases are used widely, with both Macs and mainframes as hosts.

The results from a recent MacWEEK survey of large Macintosh sites appear to debunk the lingering condemnation that Macs aren't good database machines. On the contrary, Macs serve as hosts for multi-user databases in almost seven out of 10 sites that have any multi-user databases at all. Indeed, ACI US Inc.'s 4th Dimension is as common at large, networked Mac sites as Oracle Corp.'s Oracle. Almost two-thirds of the sites surveyed have Mac clients accessing

multi-user databases somewhere on their networks. Many of these databases reside on non-Mac hosts, and the most common interface seen by these Mac-using database clients is that of a terminal emulator.

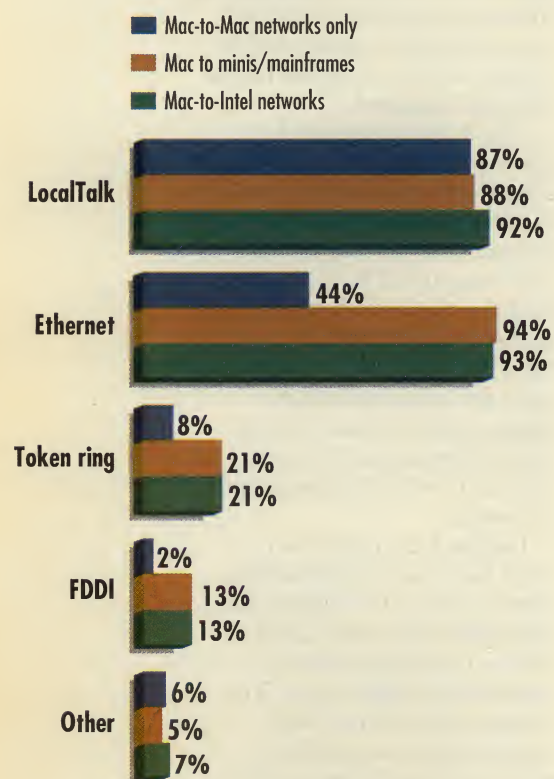
Sites where Macs share a networked database span the spectrum. They include those taking the easy way out with Claris Corp.'s FileMaker and those attending to Oracle Corp.'s self-named relational database-management system. There are more of the former than the latter, but the survey results indicate a lot of overlap between high-end and low-end database sharing.

Half the sites that have any kind of multi-user database accessed by Macs are using Digital Equipment Corp. VAXes as hosts. Forty-five percent are using mainframes, and almost the same number are running Claris Corp.'s FileMaker in multi-user mode on Macs somewhere in the organization. IBM PCs and compatibles and Unix workstations are used as database hosts at 30 percent and 34 percent of sites, respectively.

The combined popularity of mainframes, the VAX family and Unix workstations as database hosts predicts the likelihood of terminal emulators on Mac clients (75 percent).

However, nearly half of the sites

Network media usage by type of site



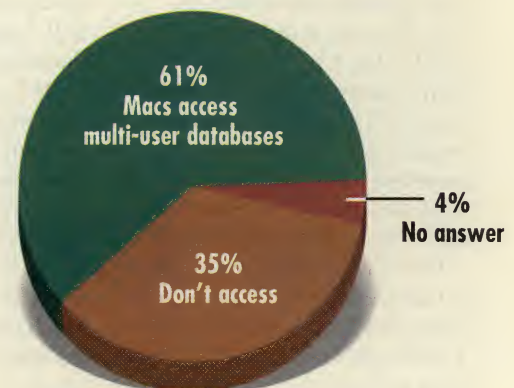
Base: Have specified type of network installed

Configuration differences by type of network

	Mac-to-Mac networks only	Mac to minis/mainframes	Mac-to-Intel networks
Number of Macs installed	286	552	601
Average percentage of Macs that are in LANs	75%	84%	86%
Average number of Macs that are in LANs	215	464	517
Average number of LANs	10	29	31
Average number of Macs per LAN	22	16	17

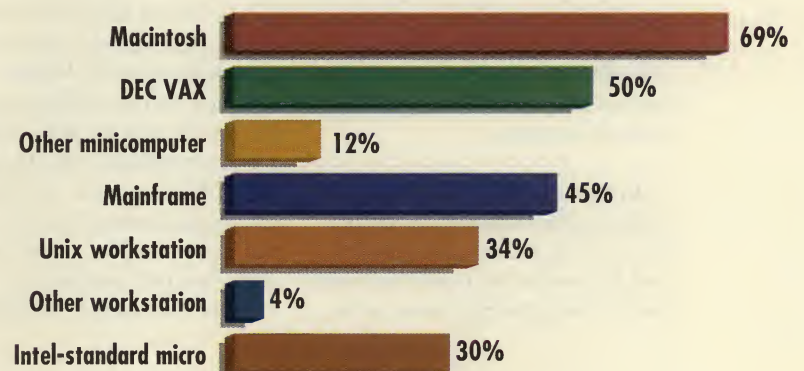
Base: Have specified type of network installed

Sites that have multi-user databases accessed by Macs



Base: Have Mac networks

Types of platforms used for multi-user database hosts



Base: Have multi-user databases accessible by Macintoshes

using networked multi-user databases with their Macintoshes have some other kind of custom client interface, which they are very likely to have developed in-house.

Interestingly, more than one-third of the sites with shared data-

bases employ spreadsheets as the means of access. That's more than the 28 percent using Claris' HyperCard for that purpose and a lot more than the 5 percent who have adopted specialized data-dipper programs. □

A multi-user database primer

Managers

need to

understand

database

issues from

the front,

middle and

back ends.

By George Lawton and Mitch Ratcliffe

The Macintosh's user-friendly interface makes it an ideal window through which to view data — whether that data is in a spreadsheet, static document or the structured screens of a multi-user database. In most companies, however, only a fraction of the data required by users resides on their Macs.

Cross-platform corporate databases act as the bridges between users and the information they need when making business decisions, but access is not always as simple as clicking on an icon. Many of the back-end services that star in the database world are village idiots when it comes to talking to Macs.

Managers must make decisions about which database server, which front-end interfaces and which fea-

tures will be part of their data-access equation — and those decisions can affect your company's overall productivity tremendously.

Front, middle and back.

Implementing a database across a multiprotocol, cross-platform network requires familiarity with three types of software: client-side front-end applications; database-management systems, which reside on the host; and so-called middle-ware, which connects the two. In the varied world of shared databases, the host can be a Mac, IBM PC or compatible, mainframe, minicomputer, or workstation.

The front end is the part of the equation that the user sees. Most programs for bringing data across a

See Database primer, next page

Database primer *From Page 23*

network require that it be viewed in developer-defined screens. At their best, these client interfaces are Mac-like, such as those created in ACI US Inc.'s 4th Dimension. Similarly, data retrieved from Oracle Corp.'s Oracle6 and Oracle7 databases on any platform can be displayed via a Mac interface designed using the company's OracleCard application and presentation tools.

Data-dipper applications, such as ClearAccess from ClearAccess Corp. and DataPrism from Brio Technology Inc., let users design, store and execute database queries and incorporate the results directly into spreadsheets or other applications.

Some applications, such as ClearAccess and GQL from Andyne Computing Ltd., provide their own local database functionality. Data returned by the server to the client is loaded into these minidatabases so users can perform further analysis without depending on network access.

In the middle. Middleware is software that resides on the client, host or both and translates queries and data as they are passed back and forth. Users generally never come

face to face with middleware.

Apple's Data Access Language (DAL) can be described as a type of middleware since it is responsible for translating Mac queries to the SQL language used in specific relational databases.

DAL extensions are available for most major SQL servers, enabling communication between Mac-based front ends and almost any other type of SQL database on a network (assuming appropriate network connections are available). DAL consists of two sets of code, which reside in the client's operating system and on the back-end server. Other middleware, such as Microsoft Corp.'s Open Database Connectivity (ODBC) application programming interface, require software on clients only.

In the DAL model, the Data Access Manager built into System 7 translates Mac requests into a generic format that can be carried over the particular protocols running on the network. When a SQL host that is running the DAL server-side software receives this query, it translates it into the version of SQL spoken by the database residing on the host. Data is returned to the Mac client through a reverse set of translations.

There are a number of third-

party middleware products, including EDA/SQL from Information Builders Inc., SQL*Net from Oracle and SequeLink from TechGnosis Corp. With these products, the middleware code typically works with a front-end application that communicates with a specific type of server software.

Gerald Caussade, president of ClearAccess, said EDA/SQL is the most popular Mac middleware. But he said that Apple's DAL, which was bundled with System 7.0 and then unbundled from 7.1, is the most prevalent and most often ignored of the available Mac-to-SQL options.

Caussade warned that users should not assume that SQL connectivity is the be-all and end-all of database access. He said that only 25 percent of the data in most corporations is stored in SQL databases; the rest is in older flat-file databases. EDA/SQL, he said, is the only link that allows front-end applications to use SQL to access non-SQL databases.

Another, more sophisticated type of middleware is represented by MitemView from Mitem Corp. In the hands of a front-end developer, MitemView can be made to recognize the data presented by the old-style terminal screens of a mainframe or minicomputer database. MitemView then translates that data into a form useful to Claris Corp.'s HyperCard, Aldus Corp.'s SuperCard or 4D front ends. The program watches for patterns in the database screen output and extracts relevant data; Mac-generated queries are translated into screen-based commands understandable to the back-end application.

The back end. The server side of the database equation includes the host computer, the database-management system that runs on it and sometimes a bit of middleware code.

Major multi-user database applications in use



Base: Have multi-user databases accessible by Macintoshes

Database-management systems, such as Oracle's Oracle6 or Sybase Corp.'s SQL Server, run on a variety of hardware, including PCs and mainframes, and listen for data requests from networked clients. When a query arrives, the server grinds through its records to find matches, which are returned to the client and displayed.

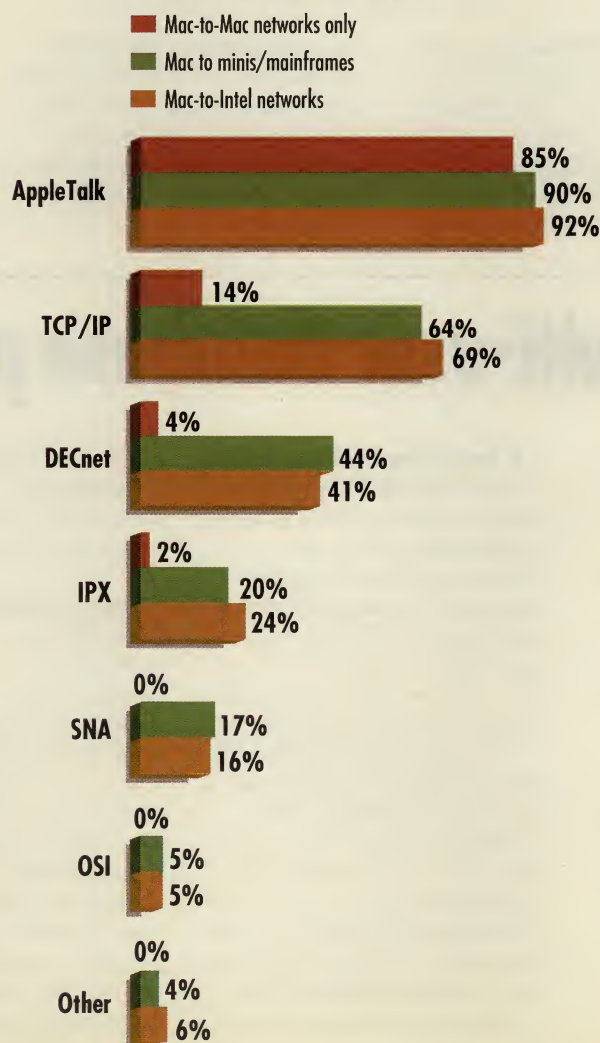
Most such databases are designed to support either relatively simple access to information, such as stored accounting data and reports, or on-line transaction processing (OLTP), the highly volatile exchange of data between the host and multiple users. In an OLTP environment, integrity of input and output has been the biggest concern because without adequate protection, it's easy for one user to overwrite changes made by another.

Imagine Joe, an order-entry clerk, has a caller on the line who wants to order 1,000 widgets. Joe pulls up his order-entry screen in the front-end application and makes a kilo-widget request. The request, in the form of a SQL query, travels to a mainframe, where a database determines that there are only 600 widgets left in stock and returns this information to Joe. This is a classic OLTP situation, and such exchanges typically would be happening with dozens of users at a time. That's where the problems arise.

Suppose Joe would like to add a comment to a customer's record to indicate the content of their conversation, and a supervisor in the manufacturing group wants to add a comment to the same record.

Owing to the nature of standard databases, the latest update to a field supersedes the changes made in an earlier one. So if Joe and the supervisor open the record at the same time, but Joe finishes his comments first, his note will be erased

Protocol usage by type of site



Base: Have specified type of network installed

when the supervisor closes and saves his comments.

OLTP database management thus depends on a feature called record locking, which prevents the overwriting of information by two users accessing data at the same time. If the database has this feature, the record Joe is working with is locked so no one else can make changes to it. While record locking has been standard for years in multi-user databases, it's essential that any installed middleware and even front-end applications support the feature properly on the database host. According to Caussade, all Mac middleware products on the market today support record locking.

Trusty trigger. Another feature being touted by vendors today is the ability to initiate a number of database changes on the host through a trigger. A trigger is a type of macro, which may be as simple as adding a number to a transaction-count log after each new transaction. More-complex triggers can rearrange data to reflect changing business circumstances.

Let's say that Joe's company has a few shaky customers with problems making their payments on time. Using triggers, the corporate database could cancel all unshipped orders to customers automatically when they have missed scheduled payments.

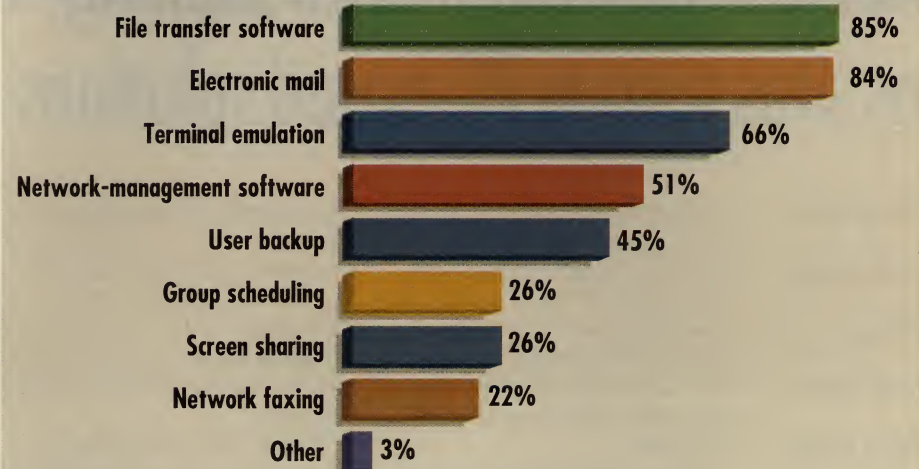
Not all host databases support triggers. Some, such as Sybase's SQL Server and Oracle7 can, while others, such as Oracle6, IBM Corp.'s DB2 and Informix Software Inc.'s databases, cannot.

In a more complicated scenario, Joe's company would like Joe to know whether a customer is approved for a particular line of credit before he accepts an order. Each customer's account could have the same limit, but being a pragmatic customer-centered enterprise, the company has decided that credit decisions should be based on each customer's payment history. The database can be coded so this whole credit-checking operation is stored on the server in a database procedure, which Joe can access by clicking a button on his display.

The stored procedure operates much like a batch file, in that it performs a number of repetitive operations on data extracted from a database. If the customer's payment history is good, Joe will receive immediate approval for the order.

Some middleware programs, such as DAL, support stored procedures. A few database-management systems, such as Sybase's, are optimized for stored procedures. According to Caussade, these optimized procedures can run up to 10 times as fast as standard stored procedures.

Related survey results: Other network apps used



Base: Have Mac networks

A database glossary

Administrative overhead: The amount of time the network manager spends maintaining the integrity of stored data.

Data Access Language (DAL): Apple's programmer-level interface to SQL and flat-file databases.

Data Access Manager (DAM): Apple's system-level interface to SQL and flat-file databases, which works through either DAM extensions or DAL.

Data dippers: Applications that provide graphical interfaces for building database queries and loading data into main-stream productivity applications.

Database-management system (DBMS): Server software, such as that from Oracle Corp., that makes a relational database available to multiple users, usually over a network.

Distributed database: A set of related data, controlled by a single DBMS, which is located on multiple, networked servers.

Front-end application: A program for presenting data retrieved from a database server.

Some Mac database applications can act as front ends to networked databases.

Middleware: Software that translates queries and results between front-end applications and database servers.

On-line transaction processing (OLTP): A networked database environment in which multiple users simultaneously update information stored in a database.

Record locking: A feature that prevents the overwriting of information by two users accessing data at the same time.

Stored procedures: A macro or program stored on the database host that can collect, analyze or alter data within a database.

Trigger: A macro that can execute a preset routine when particular variables are changed within a database.

Two-phase commit: A DBMS capability that propagates the changes in one database across a distributed database system.

mit," which propagates the changes made to data located in one database to all of the other databases that track the same piece of information.

For instance, if Joe were to change a customer's status on the host he used, a database with two-phase commit capabilities would pass that change to all of the other databases with the same customer.

Making databases of all types available to Macs on the network does not have to be a nightmare. But network managers need to take into consideration how the different components on the network can work together to suit their applications. □

Product Info

ACI US INC.

4th Dimension: \$895; **4D Server:** \$1,495 for three users; \$2,495 for six users; \$3,495 for 10 users; add \$1,000 for each additional five users
10351 Bubb Road, Cupertino, Calif. 95014
Phone (408) 252-4444;
fax (408) 252-7765

ANDYNE COMPUTING LTD.

GQL/User: \$495; **GQL/Admin:** \$1,995; **GQL/Design:** \$995
552 Princess St., Second Floor, Kingston, Ontario K7L 1C7, Canada
Phone (613) 548-4355;
fax (613) 548-7801

APDA

Data Access Language: client software bundled free with third-party applications; \$4,500 to \$30,000 for database server-side software
P.O. Box 319, Buffalo, N.Y. 14207
Phone (716) 871-6555 or (800) 282-2732; fax (716) 871-6511

BRIO TECHNOLOGY INC.

DataPrism: \$399 for single user; \$3,392 for 10 users; \$7,980 for 25 users
444 Castro St., Suite 700, Mountain View, Calif. 94041
Phone (415) 961-4110;
fax (415) 961-4572

CLEARACCESS CORP.

ClearAccess for the Mac: \$460
200 W. Lowe St., Fairfield, Iowa 52556
Phone (515) 472-7077 or (800) 522-4252; fax (515) 472-7198

INFORMATION BUILDERS INC.

EDA/SQL: \$8,000 to \$118,500
1250 Broadway, New York, N.Y. 10001-3782
Phone (212) 736-4433;
fax (212) 967-6406

MITEM CORP.

MitemView: \$7,000 for developer tools; \$300 per runtime version
2105 Hamilton Ave., Suite 350, San Jose, Calif. 95125
Phone (408) 559-8801;
fax (408) 559-7201

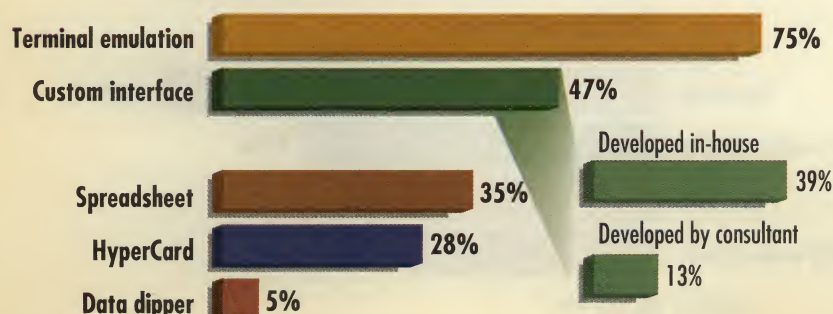
ORACLE CORP.

OracleCard: \$699 for developer version; \$299 per runtime version;
SQL*Net: \$199
500 Oracle Parkway, Redwood Shores, Calif. 94065
Phone (415) 506-7000; fax (415) 506-7200

TECHNOSIS CORP.

SequeLink: \$1,495 for server; \$295 per client
301 Yamato Road, Suite 2200, Boca Raton, Fla. 33431
Phone (407) 997-6687 or (800) 321-0543;
fax (407) 241-6143

Types of interfaces used to access multi-user databases



Base: Have multi-user databases accessible by Macintoshes

AppleShare dominance slipping as sites turn to PC-based solutions

Many sites plan to buy PCs as servers for Macs in the next year:

The king of the hill in file servers for Macs is still AppleShare, according to MacWEEK survey respondents. But if a large Mac site is installing a new server for Mac users in 1993, the odds are pretty close as to whether the server hardware will be a Mac or an IBM PC or compatible.

When we asked large sites with networks to name the types of computers and software being used as

file servers by Macintosh clients, 75 percent were using AppleShare and 56 percent used System 7 file sharing, both of which run only on Macs. (Since many kinds of server platforms can be in use at the same site, the percentages add up to more than 100.)

It appears that this ubiquity of Mac-based servers for Mac clients is not a future trend, however. While 86 percent of sites that have net-

works said they had at least one Mac working as a server, only 58 percent planned to install a new one in the coming year. While not every site that has a file server today is going to add another in the next 12 months, this appears to be a significant drop in Mac server confidence.

Most of the respondents with networks have IBM PCs or compatibles as servers for Macs already. Forty-one percent report Novell Inc.'s NetWare installed, compared with Microsoft Corp.'s runner-up LAN Manager at 15 percent. When asked to project their purchases into the future, 43 percent of networked sites said they planned to install a PC as a server for Macs in the next 12 months, and 30 percent were looking at NetWare in this role. LAN Manager was entertained as a future possibility at only 9 percent of sites.

Sitka Corp.'s products came in third in this server popularity contest: 10 percent of respondents said they were using DosTOPS somewhere on their networks, and 16 percent were running MacTOPS. But only 3 percent of sites running Mac or PC servers said they would consider these programs for new installations.

While it is not surprising that NetWare is an industry standard for serving both Macs and PCs, two other platforms made unexpectedly good showings. Digital Equipment Corp. VAX computers or any mini-

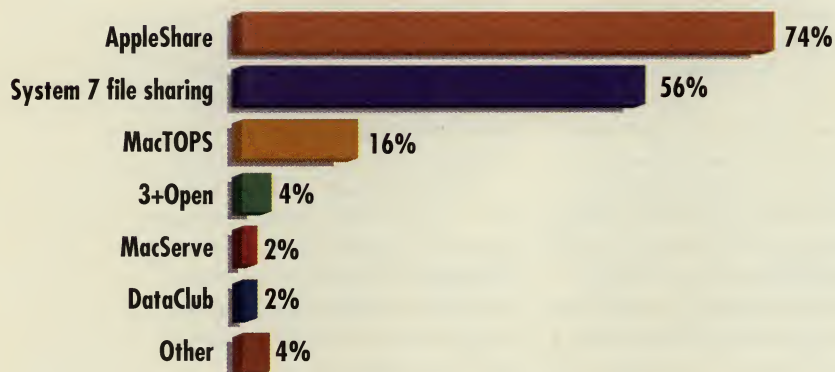
computer or workstation running Unix are used as file servers for Macs in a little more than two out of five sites with networks.

One out of three sites surveyed with networked Macs is running DEC's Pathworks for Macintosh — the main product of the much-maligned Apple-DEC alliance. And the users seem to like it: 18 percent of networked sites plan to base a new server on a VAX in the next year, and the majority of those are considering Pathworks.

On the Unix side, the Network File System protocol commonly run on Unix workstations and minis is being used to share files with Mac clients at more than one-quarter of networked sites. Similarly, about one-quarter of the surveyed sites are considering pressing a Unix-based computer into file service for Mac clients during the next 12 months. These pro-Unix numbers may reflect the preferences of the 29 percent of respondents who work in education.

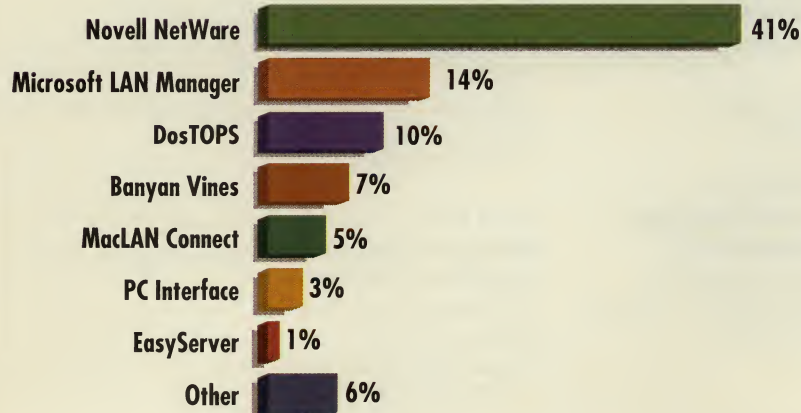
AppleShare is in use at more offices than any other file server for Mac users, and NetWare definitely is a comer in the field, but there's quite a bit of diversity at large networked sites. MacWEEK's survey found eight different server programs that each were in use in at least 10 percent of sites. Happily for the network managers, the average site restrains itself to three. □

Software used with Macintosh file servers



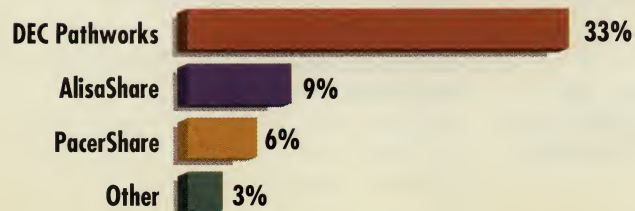
Base: Have Mac networks

Software used with Intel-standard file servers



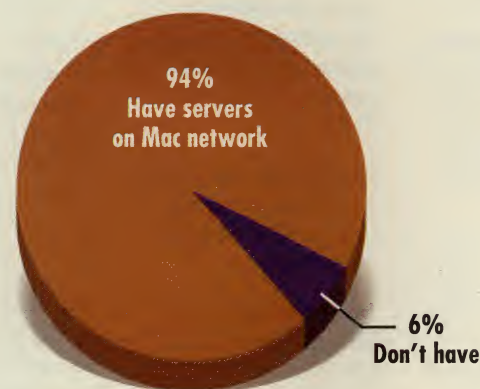
Base: Have Mac networks

Software used with DEC VAX file servers



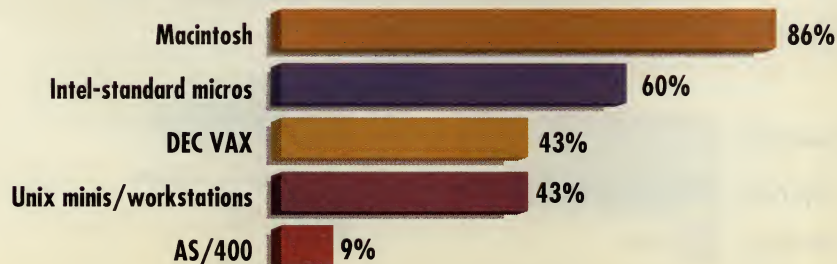
Base: Have Mac networks

Sites with dedicated file servers accessed by Mac users



Base: Have Mac networks

Types of computers used as file servers for Mac networks



Base: Have file servers used by networked Macintoshes

Give your network a future.

RISC•Router 3000E

Tx ▶ ◀ Rx
Ethernet A Ethernet B

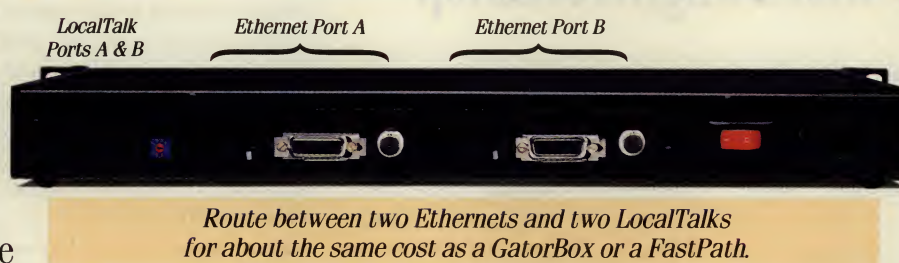
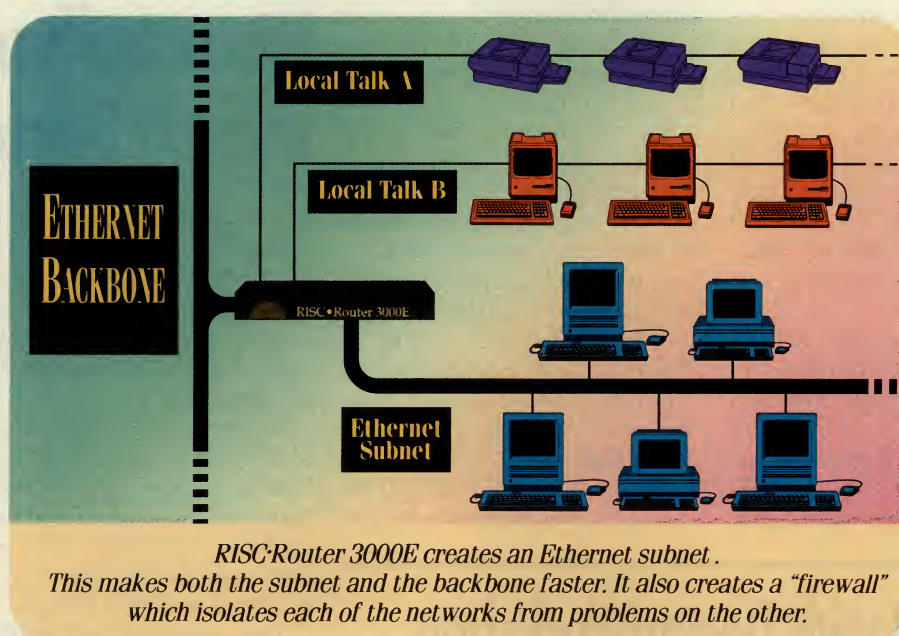
RISC•Router 3000E Ethernet-to-Ethernet Router, with 2 LocalTalks, \$2995.

Q: Why does my network need Ethernet-to-Ethernet routing?

A: Performance and reliability. By using a RISC•Router 3000E to link an Ethernet subnet to a central backbone network, you can reduce network traffic on both sides of the router.

Q: How does RISC•Router 3000E give my network a future?

A: It gives you an upgrade path. RISC•Router 3000E includes two LocalTalk ports, and can be installed for about the same cost as a Ethernet-to-LocalTalk router like the GatorBox or FastPath. As your Macintoshes on LocalTalk require additional network speed, you can simply upgrade them to Ethernet and connect them to RISC•Router 3000E's Ethernet subnet.



Q: Does the RISC•Router 3000E support the standard set of features I've been using on my Ethernet-to-LocalTalk routers?

A: Absolutely. And more! It supports AppleTalk Phase I and Phase II, TCP/IP and DECnet, MacTCP, atalkad, AppleTalk in IP tunneling, RIP, SNMP, and our own Advanced Network Security Protocol (ANSP™).

Q: What advantages does the RISC•Router have over other Ethernet-to-Ethernet routers?

A: Macintosh based management tools. A Macintosh-aware feature set, with ANSP™ and Ethernet-to-Ethernet tunneling. Support for thick, thin, and 10BaseT Ethernet on each Ethernet port. Dazzling performance, and a very aggressive list price.

Q: How can I get more information, and complete technical specifications?

A: All of our products are available through Ingram Micro and Tech Data, or call us toll free at 800-356-0283. We'll be happy to send you complete information on RISC•Router 3000E, and our other Macintosh Ethernet products.

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Mitsubishi cooks up Level 2 color

Tab-size thermal prints full bleeds

By Matthew Rothenberg

White Plains, N.Y. — Mitsubishi International Corp. this month will add a tabloid-size thermal-transfer model as well as PostScript Level 2 support to its line of 24-bit-color printers.

The CHC-746i ColorStream/



The ColorStream/Plus will output full-bleed, tabloid-size images in 24-bit color and will ship with Level 2 emulation.

Plus, slated to ship for \$7,950, will print full-bleed 300-dpi images to tabloid-size paper or transparencies in CMY (cyan, magenta, yellow) or CMYK (cyan, magenta, yellow, black). It will output a three-color graphic at maximum size and resolution in about one minute, five seconds, Mitsubishi said.

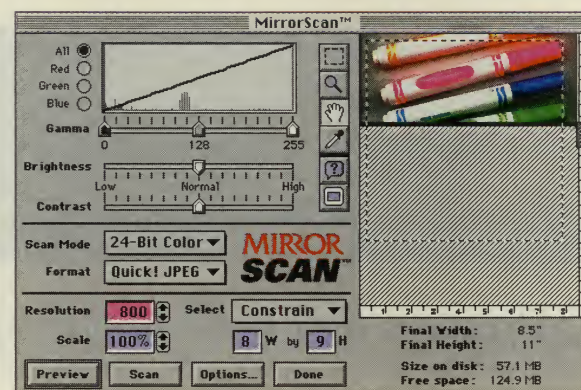
The new printer will come standard with ROM cards containing the Level 2 version of PowerPage, the PostScript interpreter from Pipeline Associates Inc. of Morris Plains, N.J.; 35 Type 1 fonts; and HP-GL. It will switch automatically among LocalTalk, RS-232 serial and Centronics parallel interfaces, and it will include a SCSI port for a hard disk.

The ColorStream/Plus is based on a Shinko engine and features a 16-MHz AMD 29000 RISC chip with an FPU (floating-point unit) running 14 Mbytes of RAM, which can be expanded to 38 Mbytes. It will ship with a 100-sheet paper cassette.

In addition, Mitsubishi last month reduced the price of its CHC-S446i ColorStream/DS to \$9,950 from \$11,900, and this week the company will introduce a Level 2 upgrade for the letter-size dye-sublimation printer. All current printer models will ship standard with Level 2; owners who bought a ColorStream/DS last month can upgrade free from the Level 1 version of PowerPage; other users can get the Level 2 ROM card for \$395.

The ColorStream/DS prints 300-dpi CMY or CMYK images measuring up to 8.5 by 12.3 inches, and it can output a letter-size, eight-bit-color image in about five minutes. It is based on a Shinko engine and includes a 25-MHz AMD 29050 RISC chip with an FPU; 14 Mbytes of RAM, expandable to 38 Mbytes; and LocalTalk, serial, parallel and SCSI interfaces (see MacWEEK, July 13, 1992).

Mitsubishi said it will ship an
See Mitsubishi, Page 31



The MirrorScan software bundled with Mirror's 600- and 800-dpi color scanners provides color previews, a variety of image tools and controls for Mirror's JPEG compression-board option.

Mirror buffs up its color flatbeds with JPEG accelerator boards

By Matthew Rothenberg

Roseville, Minn. — Mirror Technologies Inc. this month will ship a new line of 24-bit-color flatbed scanners and optional hardware acceleration of JPEG compression and decompression.

The \$999 Mirror 600 Plus and \$1,299 Mirror 800 Plus will feature hardware resolutions of 600 by 300 dpi and 800 by 400 dpi, respectively. Software interpolation will raise their respective resolutions to 600 by 600 dpi and 800 by 800 dpi.

The scanners will include a CCD (charge-coupled device) sensor that captures up to eight bits each of RGB (red, green, blue) data per pixel in three passes and eight-bit gray-scale or monochrome images in a single pass. Each scanner has an image area of 8.5 by 11.5 inches and will scan a 600-dpi, letter-size color image in eight minutes, Mirror said.

Both models are based on proprietary engines and include a SCSI interface and hardware gamma controls. They will ship with MirrorScan software, which supports TIFF, Encapsulated PostScript, PICT and

QuickTime JPEG (Joint Photographic Experts Group) formats. MirrorScan lets users preview color images; adjust brightness, contrast and gamma curves; select white and black points; and scale images from 12 percent to 800 percent in 1 percent increments. The software comes as a stand-alone application, a desk accessory and a Photoshop plug-in.

Mirror also will introduce the \$1,399 Mirror 600 Pro and \$1,699 Mirror 800 Pro, which will come with a NuBus board that uses a C-Cube 550B chip to speed QuickTime JPEG compression up to five times at ratios of up to 50-to-1, Mirror said. Owners of a 600 or 800 Plus can upgrade to the NuBus board for \$599.

Users of any Plus or Pro scanner can get the complete version of Adobe Photoshop 2.01 for \$200, \$695 off the retail price of the image-editing application. Mirror also offers a \$599 transparency attachment for the scanners.

Mirror Technologies Inc. is at 2644 Patton Road, Roseville, Minn. 55113. Phone (612) 633-4450 or (800) 654-5294; fax (612) 633-3136. □

Artifice recasts CAD for 3-D with DesignWorkshop

By April Streeter

Eugene, Ore. — Artifice Inc. next month will deliver DesignWorkshop, CAD software that will help drafters and designers make the jump to 3-D rendering.

The \$895 package will ship with a standard set of 2-D and 3-D drawing tools; additional tools to draw openings in 3-D objects; and SpaceJump, a feature that aligns objects in 3-D space.

"What makes this program unique is that all designing takes place in the 3-D space," said Bart Shorak, DesignWorkshop beta tester and intern architect at Peter

Stoner Architects in Seattle. "I had experimented with ArchiCAD (from Graphsoft Inc.), but the fact that you don't need to switch views makes [DesignWorkshop] more logical. For clients who don't have a good idea of what I'm visualizing, I can create a 3-D model in a few hours."

Other features will include:

► **Eye tool.** When moved around a window, this tool will change drawing perspectives and will redraw objects according to the new view. A 3-D cross hair will help users stay oriented in 3-D space.

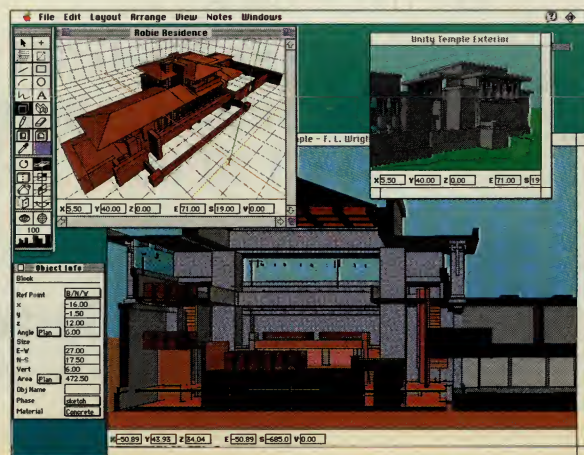
► **Mix-and-match sizing.** Users will be able to resize 3-D shapes by

dragging corner points or typing coordinates into an InfoBox window.

► **Extras.** DesignWorkshop will allow users to set the direction of sunlight in drawings and save a series of the drawings as a QuickTime clip. A view-only utility called DesignView will let others view modeled designs with a fraction of the memory of the full program.

Artifice Inc. is at P.O. Box 1588, Eugene, Ore. 97440. Phone (503) 345-7421; fax (503) 346-3626. □

Artifice's DesignWorkshop lets users model CAD drawings in 3-D space without switching between 2-D and 3-D views.



Thumbs Up points way to warehoused graphics

By April Streeter

Raleigh, N.C. — Graphic Detail Inc. recently shipped an archive and catalog-database program.

Thumbs Up, priced at \$995, allows one user to keep an archive of an unlimited number of 24-bit-color images on a hard drive or other volume connected to the user's Mac.

Thumbs Up also is available in a \$9,995 network version, which lets users distribute catalogs among multiple networked vol-

umes. Path indicators point users to archived images.

Both versions use JPEG (Joint Photographic Experts Group) compression to slim image files. Compression can be accelerated with hardware JPEG boards, such as Storm Technology Inc.'s \$999 PicturePress.

Users can search images with a variety of keywords contained in 25 alphanumeric fields. Graphics can be displayed in a 15-thumbnail-per-screen window, two to a win-

dow, or as single images displayed along with field information or covering a 640-by-480-pixel screen.

An upgrade scheduled for release this summer will be able to archive and retrieve QuickTime movie clips; it also will include some of Storm's JPEG code, which Graphic Detail said will make an additional accelerator board unnecessary.

Graphic Detail is at 4020 Westchase Blvd., Suite 500, Westchase One, Raleigh, N.C. 27607. Phone (919) 833-3366; fax (919) 833-0777. □



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SUPERMAC™
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Diaquest app handles video devices

By Neil McManus

Berkeley, Calif. — Diaquest Inc. last week shipped an application that lets the Mac control videodisc recorders and frame-accurate video decks.

Diaquest's DQ-MAC232, priced at \$995, works with Sony Corp.'s EVO-9650, a frame-accurate Hi-8 animation VCR. It also controls serial-controlled videodisc devices, such as Sony's LV-3000N write-once disc recorder and Pioneer Electronic Corp.'s VDR-V1000 read-write laser disc recorder.

The Diaquest application works with video-graphics boards to output Mac graphics accurately. In addition, users can work with bundled Adobe Photoshop plug-ins and XObjects for MacroMind Director and other programs from MacroMedia Inc. of San Francisco.

Until April 15, Diaquest will bundle a free copy of a \$495 application that lets users work with source video sequences on a frame-by-frame basis to create high-quality rotoscoping and paint effects. It also uses alpha-channel information to composite an image



Diaquest's DQ-MAC232 application outputs Mac graphics, QuickTime movies and animations to frame-accurate video devices. Additional Diaquest software lets users work with source video sequences on a frame-by-frame basis.

against a background. Such compositing capability had been limited to proprietary video systems, such as Quantel Inc.'s Harry video-effects system.

Diaquest's DQ-MAC232 offers most of the software functionality of its \$2,595 DQ-Animaq NuBus card. This controller board, howev-

er, supports a variety of high-end serial and parallel video devices. It also ships with Diaquest's QuickPass software, which speeds output of full-screen, full-motion QuickTime movies to video.

Diaquest Inc. is at 1440 San Pablo Ave., Berkeley, Calif. 94702. Phone (510) 526-7167; fax (510) 526-7073. □

In Focus trims presentation prices; cost cuts span panels, projectors

By Nathalie Welch

Tualatin, Ore. — In Focus Systems Inc. last month cut prices by as much as \$1,000 on a range of its presentation hardware.

The company trimmed the price of its 640-by-480-pixel LCD panels: The 16-color 1600LC was reduced by \$300, to \$2,395; the 5000FX, which supports almost 5,000 colors, was reduced by \$1,000, to \$2,995; and the 7000FX+, which provides a palette of 24,389 colors, was reduced by \$500, to \$3,995.

In Focus reduced the price of its LiteShow II projection system to \$1,695, a \$300 cut. The device, which includes a 1.44-Mbyte floppy drive and a remote control, connects to any VGA-compatible projection panel. It comes with LiteTools, a \$495 presentation application that lets users capture and store a "slide show" of Mac images to floppy for playback on the LiteShow II with no Mac attached.

In Focus also trimmed the price of

Lite-Pro LS, which includes LiteShow II and projects graphics in 4,913 colors at a resolution of 640 by 480 pixels; the new price is \$6,995, a \$500 reduction.

The company cut \$1,000 off the TVT-3000, a 1.4 million-color active-matrix LCD panel capable of full-motion video, as well as the System 3000, which includes the TVT-3000 and a video adapter. The devices now cost \$4,995 and \$5,495, respectively.

In Focus cut \$500 both from the TVT-6000, a 24-bit-color projection and presentation system with an active-matrix LCD panel and full video and audio support, and the System 6000, which comprises the TVT-6000 plus a data and video-scan converter.

The TVT-6000 and System 6000 now are \$6,995 and \$7,995, respectively.

In Focus Systems Inc. is at 7770 S.W. Mohawk St., Tualatin, Ore. 97062. Phone (503) 692-4968; fax (503) 692-4476. □

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This enhanced model will include voice messaging capabilities and software, as well as Flash ROM — allowing remote firmware upgrading & enhancements.

New collections enter clip-art scene

Graphics fit for lab, school and business

By Kirsten L. Parkinson

San Francisco — An array of new clip-art collections offer a variety of images and background designs to users looking to brighten up their documents.

► **Image Club Graphics Inc.** has upgraded its \$799 ArtRoom 5.2 CD-ROM with new Science and Medicine categories; 80,000 additional keywords for searching; and a browser version of Fetch, the cataloging application from Aldus Corp. of Seattle. It now offers more than 9,300 color and black-and-white Encapsulated PostScript images. Upgrades from Version 5.0 are \$49.

► **TechPool Corp.** last month released Atmosphere Systems, five separate \$129 collections of full-page EPS backgrounds for use in page-layout, paint and word processing programs.

The five sets, which include cityscapes, patterns and geometric

shapes, offer both color and gray-scale versions of each design.

Each volume of Atmosphere Systems ships with Watermark, a utility that lets users convert the images to other formats, including PICT and TIFF, and create special effects.

► **Teach Yourself By Computer Software Inc.** recently released three \$39.95 sets of black-and-white clip art in EPS, PICT and Paint formats.

EduClip Images 1 offers images of sports, classroom settings and holidays. Volume 2 includes letters and numbers embedded with related images. These images can be ungrouped from the letters and used separately.

EduClip Images 3 incorporates

graphics for different school subjects, such as math, literature and biology, as well as holiday and business themes.

Image Club Graphics Inc. is at 1902 11th St. S.E., Suite 5, Calgary, Alberta T2G 3G2, Canada. Phone (403) 262-8008 or (800) 661-9410; fax (403) 261-7013.

TechPool Corp. is at 1463 Warrensville Center Road, Cleveland, Ohio 44121-2676. Phone (216) 291-1922 or (800) 925-6998; fax (216) 382-1915.

Teach Yourself By Computer Software Inc. is at 3400 Monroe Ave., Rochester, N.Y. 14618. Phone (716) 381-5450 or (800) 724-4691; fax (716) 427-7628. □

Mitsubishi

From Page 28

Ethernet interface for the ColorStream/DS and ColorStream/Plus in the second quarter of this year, but pricing has not been determined.

Mitsubishi also moved back the release of its CHC-S746i, a full-bleed, tabloid-size dye-sublimation

printer that will ship with Level 2 emulation and a 25-MHz AMD 29050 RISC chip. Originally slated to ship by November 1992, the printer now is scheduled to ship later this year; pricing has not been set.

Mitsubishi International Corp. is at 701 Westchester Ave., White Plains, N.Y. 10604. Phone (914) 997-4999; fax (914) 997-4976. □

DAYSTAR DSP FILTERS OFFER PREVIEWS



Flowery Branch, Ga. — DayStar Digital Inc. last week released a free software upgrade to its Charger DSP-based NuBus cards that adds real-time previews to Adobe Photoshop filters.

Priced at \$949, Charger uses two programmable AT&T 16A digital signal processing chips to speed often-used Photoshop filters by up to 23 times. It ships with several filters, including High Pass, Despeckle, Gaussian Blur, Blur More, Sharpen, Sharpen More, Sharpen Edges and Unsharp Mask.

DayStar's filters now preview their effects on a portion of an image. Users can select the preview area. Filters can be adjusted via slide controls or by typing in values. Photoshop's bundled filters have no slide controls or previews.

DayStar Digital Inc. is at 5556 Atlanta Highway, Flowery Branch, Ga. 30542. Phone (404) 967-2077; fax (404) 967-3018.

Desktop Dynamo

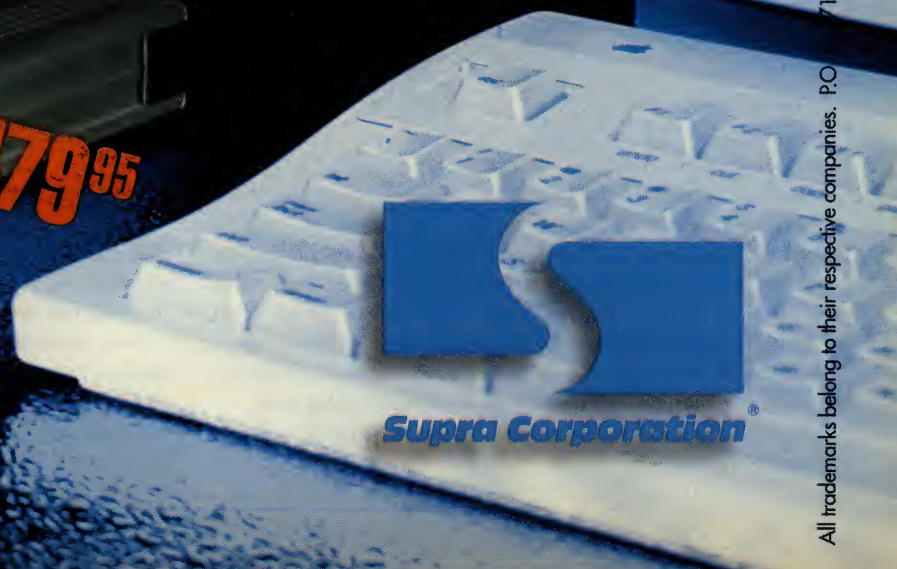
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■ "Top Honors" *MacUser* 11/92 ■ ★★★★★ *Macworld* 8/92

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News Analysis

Beyond ASCII: Products pave the way to paperless office

Document-interchange technologies attempt to transcend platforms and applications.

By Kathleen Tinkel

Although the phrase "paperless office" is more likely to inspire a resigned sigh than hope for the future, circumstances are conspiring to breathe new life into this idealistic notion.

Announcements of platform- and application-independent document formats have been thick on the ground for the past year or so. Two of these formats — Adobe Systems Inc.'s Acrobat and No Hands Software's Common Ground — likely will affect the Mac marketplace.

The paper case. The desire to exchange formatted pages between users of dissimilar applications and platforms has been around for decades, probably since the first computer incompatibility manifested itself.

When Microsoft Corp. and Apple collaborated on TrueType a couple of years ago — and Windows mimicked the Mac's graphics orientation — it appeared that computer formats would converge before the end of the century. But the specs for Apple's QuickDraw GX and Microsoft's Windows/NT,

both due this year, make this happy confluence seem unlikely.

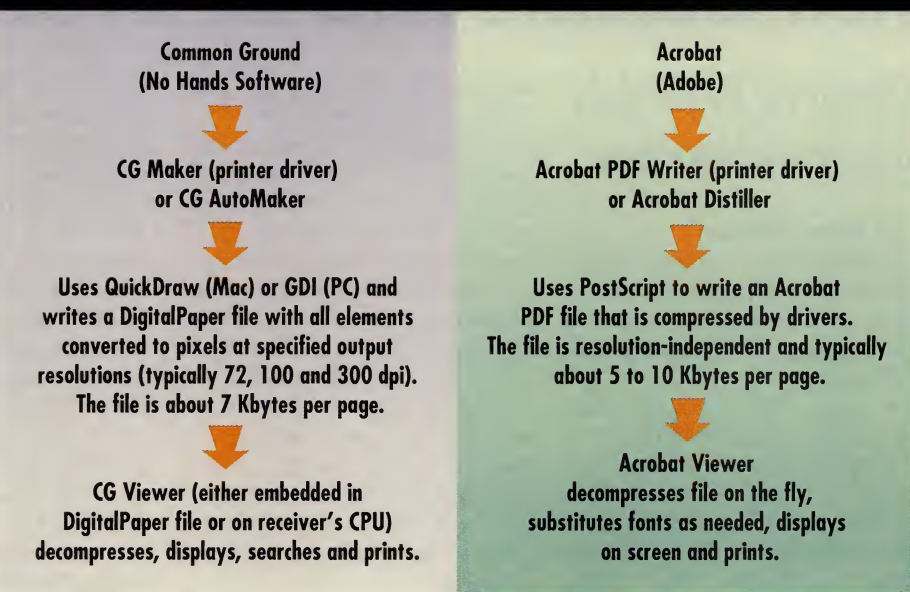
While we wait for a better solution, we compromise, exchanging data using a number of standards, each with its own limitations (see story, next page).

Several companies recently have announced document-interchange formats that may go far toward creating the paperless office. Both Interleaf Inc. of Waltham, Mass., and Northern Telecom Inc. of Nashville, Tenn., announced products a year ago (WorldView and Helmsman, respectively), but neither of these has had much effect on the Mac marketplace.

The two programs that probably will have an effect on the Mac are Acrobat and Common Ground. Both products promise to let computer users create complex files that can be read and printed out on any of the supported platforms (generally IBM PC and compatible, Mac, or Unix) without the need for the software that created the file.

Acrobat. Mountain View, Calif.-based Adobe has been hinting at its PostScript-based Acrobat tech-

A comparison of document-interchange formats



nology for about three years, and it recently released SuperATM (see review, Page 43), one of Acrobat's "core technologies." SuperATM, which is not required for Acrobat, can create substitute fonts on the fly and to order, and can facilitate font movement from one system to another. Acrobat itself has not been priced and will be released this year.

Acrobat will convert native documents from most applications on Mac, PC (DOS- or Windows-based) or Unix platforms into Adobe's Portable Document Format (PDF) files. The PDF file will encompass all visual aspects of a document, including text, bit-mapped images and other graphics, and color and font information

(including the metrics), which will travel as a compressed ASCII file.

Users will be able to read PDF files with the Acrobat Viewer software, which also will allow them to navigate through the file, mark and annotate the document on screen, and print it to any sort of output device.

Most users will create the PDF files by means of a special printer driver called PDF Writer that works with originating applications. Alternatively, a separate application, called Acrobat Distiller, will translate PostScript files into PDF files.

What will distinguish Acrobat from Common Ground — the product that competes most closely in scope and capability — is the font-substitution technology (also encapsulated in SuperATM) built into the Viewer program. If the recipient of a PDF file lacks one of the fonts, Acrobat Viewer will use a multiple-master font to build a substitute with the appropriate width, metrics and weight.

This appears to be Acrobat's primary Achilles' heel. The substitute fonts produced by SuperATM are functionally adequate; line breaks, general formatting and approximate text color are maintained. But if the designer's type selections are important, substitute fonts won't do.

The multiple-master fonts in Acrobat Viewer are a generic sans serif and a serif. If the designer used fonts that depart substantially from classical serif or sans-serif designs (including script, display and symbol fonts), they will not be well-represented by the substitutes. (Adobe probably will include Symbol and Zapf Dingbats fonts with Acrobat, as it does with SuperATM.)

Common Ground. Newcomer No Hands Software of Belmont, Calif., announced its \$189.95 Common Ground for the Mac at Macworld Expo in San Francisco for shipment this month. Like Acrobat, Common Ground promises to

SCREEN TEST

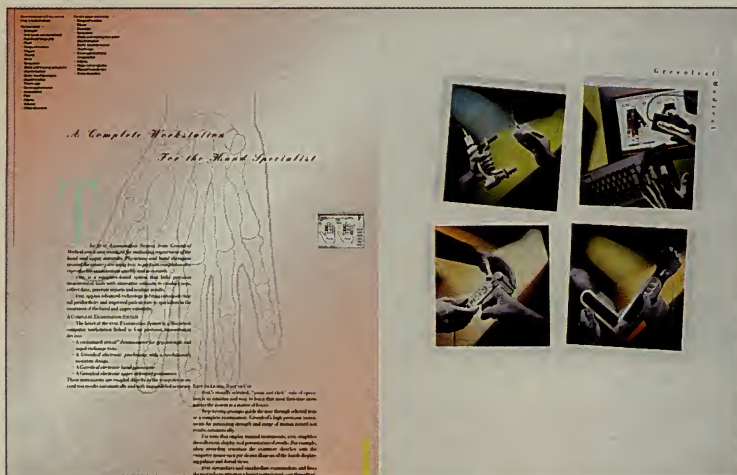
Artistic brochure gives a hand to medical diagnostics

San Francisco — An oversize medical brochure produced on the Mac has won design awards and injected an artistic element into traditionally dry medical promotions.

"The approach is unusual; it's bold to go to this level of artistry in the medical field," said designer Earl Gee, based here. "It sets Greenleaf Medical above its competition."

Gee, a graduate of the Art Center College of Design in Pasadena, Calif., with 10 years of design experience, used Aldus PageMaker to create the brochure. He said he chose an oversize layout so that it would stand out "in an industry inundated with letter-size literature."

This was Gee's first attempt at designing a project completely on the desktop. Until two years ago, he was designing traditionally but moved to the Macintosh when he went into business on his own. "When you start up a design business, the first thing you do is purchase a Mac," he said.



The brochure illustrates a component-based system for evaluating hand and arm injuries. Greenleaf's EVAL Examination System uses a Mac linked to four precision-measurement devices to conduct tests, collect data, generate reports and analyze results.

Gee used a script typeface design, Adobe Systems Inc.'s Kuenstler Black, willingly sacrificing "a bit of legibility," to emphasize "handlike writing and distinctiveness." Photographer Geoffrey

Nelson provided the photos of the EVAL system that Gee scanned in at low resolution and placed on PageMaker pages. The final photos were separated and stripped in at AR Lithographers of Hayward, Calif.

When Greenleaf used its initial 2,000 copies of the brochure, Simpson Paper Co. of San Francisco reprinted an additional 50,000 copies for free. Simpson did this to use the brochure as part of its own sample promotional materials that go to designers and printers. — By Stuart Silverstone

Current techniques for document-interchange limited

Perhaps the most common form of raw data exchange is in unformatted text and numerical data imported in ASCII text format. The ASCII format for years has been the simplest, most reliable interchange format and the only nearly universal one.

ASCII is not a WYSIWYG format, however, and everything beyond the narrow set of upper- and lowercase letters, figures and most common punctuation is carried as embedded codes that must be interpreted by a recipient. On the other hand, it is cheap and effective.

Some users, primarily federal government agencies and their contractors, use cumbersome, non-WYSIWYG tagged-text systems such as the Standard Generalized Markup Language (SGML), which has been adopted by the International Standards Organization as a standard for interchange. SGML and other coding systems, however, require trained personnel to create and read the documents, which may be why they haven't caught on.

A consortium of publishing vendors, including Agfa, a division of Miles Inc.; Atex Inc., a subsidiary of Eastman Kodak Co.; Information International Inc.; Camex; and Quark Inc., got together a few years ago to adopt and extend an ASCII-based format.

Called Publishing Interchange Language (PIL), this format, first

developed by Atex, describes page geometry and architecture — the position and size of page elements, for example. These objects may be removed and some of their attributes revised; content is handled by links to text and images, which may be stored in a variety of formats.

The current version, PIL 5.0, has been proposed as an American National Standards Institute standard, but it doesn't seem to have had much impact to date, possibly because separating content from page geometry may not be a comfortable way for people to work today, or because the committee members have not pursued the standard enthusiastically.

Graphics and pages. Bit-mapped graphics usually can be shared between Macs and IBM PCs and compatibles as TIFF documents. PostScript files of various types, including graphics saved as Encapsulated PostScript files and PostScript print-to-disk files, although bulky, can be exchanged between computers on any platform so long as a PostScript interpreter is present. Users must save a platform-specific version of the PostScript file if they want a screen preview to transfer.

Users can move documents from platform to platform using an application that runs on both: Several applications, including Microsoft Word, Aldus PageMaker, Frame Technology Corp.'s

FrameMaker and QuarkXPress, are available in Macintosh and Windows versions. Users can move files smoothly between these platforms, so long as they contain only those graphics and fonts that also can be moved from one system to the other.

Unfortunately, this means that the Mac's native graphics formats (PICT and Paint) must be avoided, since they don't exist on the PC. (In some instances, graphics can be translated from a Mac to a similar PC format and vice versa using a program such as Adobe Photoshop.)

Font follies. Fonts erect many barriers to document interchange: Font licenses generally forbid the transmission of typefaces with a document, even in print-to-disk form. Some of the most popular TrueType fonts on the PC (including some fonts distributed with the Windows 3.1 upgrade last summer, such as the extended Lucida family and WingDings) are not available on the Mac.

Even PostScript Type 1 fonts from Adobe Systems Inc. may have different names and character sets on the two platforms. This means at the very least that the person who receives the file must reassign fonts manually to retain hard-won formatting.

Specs for the next generation of digital fonts make it appear that they will differ even more drastical-

ly from one platform to another.

Microsoft Corp. introduced embedded-font technology with its Windows 3.1 upgrade last summer, but so far only one program, PowerPoint for Windows, supports the format, which in any event works only with Windows TrueType fonts. Users can configure embedded fonts so they can be written to the recipient's disk as a full-fledged reusable font, viewed only, or viewed and printed only. In every case they add about 50 Kbytes per font to the document. A typical 6-Kbyte memo would grow to 156 Kbytes if it contains one typeface in roman, italic and bold styles, for instance.

Microsoft's embedding is not supported on the Mac, and Apple is proposing to introduce its own incompatible font-exchange technology with the next major operating system upgrade for the Mac.

On the other hand, some of the new font-manipulation programs may provide a practical tool for exchanging formatted pages. Incubator Pro 2.0 from Type Solutions Inc. will "adopt" font metrics from one font and apply them to another, thus enabling a user to adapt one typeface to stand in for another. FontChameleon from Ares Software Corp., due out this quarter, will mimic existing fonts, including their metrics, for the same purpose.

These are not complete solutions, but they help solve the font-interchange problem, which is a large part of the battle for many users. — *By Kathleen Tinkel*

convert, to its DigitalPaper format, documents created by any application on the supported platforms (the Mac for now, with versions for Windows and DOS promised later this year).

Unlike Acrobat, Common Ground will work with any font — serif, sans serif, script, wildly decorative or abstract — and anything else in a computer document.

To convert a file to DigitalPaper, a user will drag and drop a file onto the AutoMaker icon or select the Maker utility from the Chooser and then print an active file to disk. Common Ground's DigitalPaper replica will be a bit-mapped version of the original document. DigitalPaper files will average 7 Kbytes per page, and users can read or print them by means of the Viewer utility.

Common Ground automatically will save files in three resolutions: 72 and 100 dpi for the screen, and 300 dpi for laser printers. Since the user will be able to define these resolutions, devices such as 600-dpi laser printers and high-resolution

imagesetters also will support DigitalPaper file output.

Although the converted file will be a sort of bit map, the Common Ground Viewer will permit the reader to search for specified text and copy both graphics (as PICT files) and ranges of live text to the

DigitalPaper would seem an elegant approach to document interchange.

Clipboard for use in other applications. A user will be able to bundle a mini-Viewer with DigitalPaper files so that a reader who doesn't have the Viewer utility can view a Common Ground document.

Although the Common Ground format sounds promising, it may be limited by its reliance on native graphics formats — PICT on the

Mac and Graphics Device Interface on Windows-based PCs. PICT files are fairly crude representations of type and drawn objects, with somewhat limited control over line weight. QuickDraw doesn't support micro-spacing of typographic characters.

Because of this, we might expect DigitalPaper replicas to be somewhat coarser than the original files. Considered abstractly, however, DigitalPaper would seem an elegant approach to document interchange.

Format future. The paperless office is still a dream, but it seems that we'll finally be able to create deliberately formatted, platform- and application-independent documents during 1993. Acrobat and Common Ground seem more likely to succeed than solutions proposed in the past.

They let the creator of the file work in native applications in WYSIWYG view, overcome potential obstacles posed by font-licensing arrangements, and should be able to create relatively small files that users can store and transmit. □

Who can use document interchange

It's not clear who needs document-interchange technology. The solutions so far proposed seem to spring more from developer capabilities and interests than from a clearly defined need expressed by the market, which seems unformed and diverse. However, users have defined problems that "document-interchange" systems could help solve, including:

- ▶ Distribution of frequently revised documents with relatively unsophisticated formatting requirements to a few readers, such as in-house documentation and instruction manuals. (Northern Telecom's Helmsman system seems designed to address this problem.)
- ▶ Publication of reference material that benefits from electronic searching.
- ▶ Desire to save paper by avoiding the need to print.
- ▶ Save money by reducing the number of pages or copies printed.
- ▶ Redistribute costs by shifting printing expense to customers or other divisions of a company.
- ▶ Find a means of transmitting formatted documents for output that avoids violation of font licenses.
- ▶ Sharing of partially formatted documents among members of a workgroup — an editor who does rough layouts in Aldus PageMaker for delivery to the art director who works in QuarkXPress, for example.
- ▶ Desire to edit and reuse heavily formatted documents created in one application — page layouts employing typography and graphics, for example — in another. Quark attempted this with its PageMaker Filter, but this is the most difficult sort of document-interchange application, and the filter is of marginal utility.

BUSINESS WATCH

► Industry news
► Market trends



The world according to Apple brass

Regional presidents outline plans for '93

By Jon Swartz

San Francisco — Apple's three regional presidents have different approaches around the world, but their 1993 business plans share the same goals: to increase market share and rack up unit sales.

In separate interviews, all three outlined their strategies in what promises to be the busiest product year in Apple's 16-year history.

Bob Puette, president of Apple's largest region, Apple USA, said the division will continue to pursue the consumer and small-business markets, as well as corporate accounts.



Apple's three regional presidents — (from left to right) Bob Puette, John Floisand and Sören Olsson — all share the same goals for 1993: increase market share and sales.

That means boosting Apple's number of consumer outlets to 2,200, offering more bundled deals through mass merchants and resellers, and making more CPUs available through the Apple Catalog, according to Puette.

With a crop of new products

expected in 1993, Apple USA faces its biggest challenge in trying to maintain the gains in market share over the past two years that made Apple the top-selling U.S. computer maker in 1992 with sales of 1.42 million units, according to BIS Strategic Decisions Inc. of Norwell, Mass.

To do so, Puette admitted, the 2,000-person division will need to improve its forecasting, manufacturing and distribution systems to keep pace with market demands — particularly at the low end and in the portable market. Otherwise, Apple faces more of the shortages that hampered sales and angered resellers and users last year.

"It was an ongoing problem last year and could roll over into this year," Puette said.

See Apple, Page 36

Computer makers struggle through a disappointing financial quarter

By Jon Swartz

San Francisco — If you weren't Microsoft Corp., SuperMac Technology Inc. or a chip maker, you weren't likely to fare well financially during the recently completed quarter. With few exceptions, most personal computer companies reported less-than-stellar sales and operating losses. Conversely, disk drive makers reported generally solid results.

► Apple said sales for its first quarter ended Dec. 25, 1992, were \$2 billion, up 7 percent from \$1.86 billion for the same quarter a year ago. But profits fell to \$161.3 million, compared with \$166 million last year. Apple attributed the drop to lower gross margins.

► Microsoft of Redmond, Wash., reported a 38 percent increase in sales, to \$938 million, and a 35 percent increase in profits, to \$236 million, for its second quarter ended Dec. 31, 1992.

► SuperMac Technology of Sunnyvale, Calif., announced fourth-quarter sales jumped 81 percent to \$39.4 million, while profits grew 87 percent to \$1.8 million. The display and graphics card

This quarter's winners

COMPANY % CHANGE

Top five in profit growth:

1. Intel Corp.	127
2. SuperMac Technology Inc.	87
3. Motorola Inc.	44
4. U.S. Robotics Inc.	41
5. Microsoft Corp.	35

Top five in sales growth:

1. SuperMac Technology Inc.	81
2. Intel Corp.	54
3. Microsoft Corp.	38
4. U.S. Robotics Inc.	33
5. Motorola Inc.	22

maker said sales for the year ended Dec. 31, 1992, rose 55 percent to \$125 million, and profits increased 138 percent to \$6 million.

► Radius Inc. revealed sluggish sales and an operating loss for its first quarter ended Dec. 31, 1992. The San Jose, Calif.-based company said sales were slightly higher, at \$36.9 million, but it lost \$713,000. Radius lost \$2.2 million in the previous year's quarter.

See Results, Page 36

NeXT loses more top executives

By Eric Lach

Redwood City, Calif. — Once again, key executives have left Steve Jobs' NeXT Computer Inc., and industry speculation is in overdrive.

Last month's departure of Richard A. Page, NeXT co-founder and vice president of hardware engineering, is only the latest in a batch of executive resignations. Late last year two other vice presidents — sales executive Todd Rulon-Miller and marketing executive Mike Slade — left the company, which is based here.

Peter van Cuylenburg, president and chief operating officer, made clear last week that although Page decided to leave for "personal reasons," there are a common set of reasons behind the rash of departures.

"For one thing, there were simply

See NeXT, Page 36

Democrats take swift action on funding of information nets

By Mitch Ratcliffe

Washington — Senate Democrats with a technological agenda bolted out of the starting blocks on the first day of the new Congress by introducing a bill that would pour \$120 million into information networks in 1994.

Senate Bill 4 (S.4), known as the National Competitiveness Act of 1993, resurrects Vice President Al Gore's call for high-speed network connections between the Internet, schools, industry, hospitals and libraries.

The bill draws heavily on Gore's Information Infrastructure and Technology Act of 1992 and President Clinton's campaign promise to assist U.S. businesses to become more competitive in the global market. The Democrats are trying to leverage their ownership of the Senate and White House by pushing

for the first infrastructure funding in 1994, two years earlier than Gore had called for last year.

Introduced by Sen. Ernest Hollings (D-S.C.), the bill also would add funding to support research collaboration between high-technology industries and the National Institute of Standards and Technology, as well as for alternative power-generation research. A dozen senators are co-sponsoring the bill.

That S.4 was introduced the day after Clinton's inauguration signals the Democrats' commitment to improve information networks. By Senate tradition, the Democrats were allotted the first five bills of the session for those issues they most want passed, while the next five were given over to the Republicans for their pet initiatives.

See Networks, Page 36

StockWatch

01.27.93 CLOSE WEEKLY % CHANGE

Apple	60.25	0.84
Adobe	41.38	4.75
Aldus	14.25	0.00
Caere	20.75	1.84
CE Software	3.63	3.57
Microsoft	86.25	-2.40
Novell	30.75	3.36
Symantec	11.63	-8.82

PERIPHERALS VENDORS

CMS	3.00	0.00
HP	71.63	-0.69
Mass Micro	0.63	-9.16
QMS	15.63	21.36
Radius	5.13	0.00
RasterOps	7.88	-1.56
Sigma	6.50	-8.77
SuperMac	22.50	7.14

STORAGE

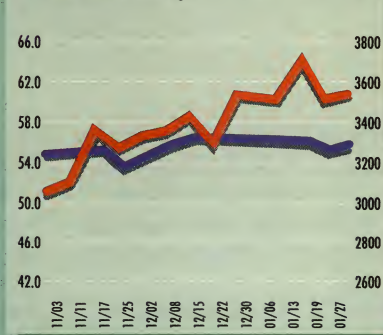
Conner	23.50	16.05
Maxtor	10.38	-2.35
Quantum	16.63	10.83
Seagate	18.13	7.41
SyQuest	21.25	-9.57

INDUSTRY INDICATORS

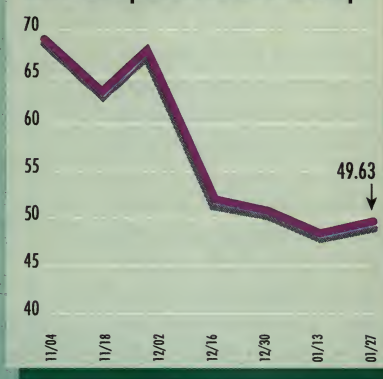
DEC	41.88	3.08
IBM	49.63	2.58
Motorola	57.38	-6.90
Sun	38.50	4.76
Dow Jones	3291.39	1.09

Compiled by Nordby International Inc.

Apple stock price..... 60.25 on 01/27/93
Dow Jones average..... 3291.39 on 01/27/93



IBM inches up after executive shake-up



After posting the worst financial loss in U.S. history, IBM Corp. did what any other struggling company would do: It fired its CEO, John Akers, and two other top-ranking executives.

Following the \$4.97 billion loss for its fiscal year 1992, the computer giant's stock inched up 2.5 percent to \$49.63 per share — less than half its 52-week high of \$100.38.

EIGHT MONTH OLD DELIVERS TWIN



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As a software developer, you hope for one Eddy award.
We got two.

Which says something about Cachet™ color correction software from Electronics for Imaging. You see, with Cachet you can not only color correct photos in seconds. Its expert color management system ensures your colors will match from screen to proof to print, saving you valuable time. So call 1-800-285-4565 or see your local dealer. Then you'll know what Cachet really delivers: high-quality color correction, quickly, easily and intuitively.



Apple

From Page 34

On the other side of the globe, Apple Pacific is the company's fastest-growing region. Fiscal 1992 sales grew at a 26 percent clip, and the 800-person division topped U.S. computer makers in Japanese personal computer unit sales with a combination of market-savvy promotions and the segmentation of its distribution network.

Apple Pacific President John Floisand said the region, which covers nearly 100 countries, also is implementing the Japanese business practice of "cooperative competition" — joint ventures with the foreign subsidiaries of U.S. companies — to boost sales in such underdeveloped Mac markets as India, China and Latin America.

Japan paced Apple's Pacific Rim surge with 50 percent growth, to about 180,000 units last year, based on estimates from InfoCorp, a Santa

Clara, Calif., research company.

Although a handful of U.S. companies — Apple, IBM Corp., Compaq Computer Corp. and Dell Computer Corp. — still claim only about 17 percent of a \$7.2 billion market, the popularity of Macs and kanji printers, coupled with price slashing among U.S. companies in recession-plagued Japan, has signaled a turnaround.

Industry analysts believe U.S. companies may grab 30 percent of the Japanese market within five years.

"If we're going to be successful in China, Korea and the rest of Asia, we must be successful in Japan," Floisand said.

As a testament to Japan's importance, Apple will introduce a bevy of new CPUs at Macworld Japan in Tokyo Feb. 10.

Apple Europe President Sören Olsson said his region this year will attempt to nearly double its market share despite recent economic uncer-

tainty throughout the continent.

Apple Europe sold an estimated 700,000 units last year, which was up slightly from 1991, according to sources. That translates into 9 percent of the European PC market, closely behind IBM and Comodore International.

Olsson said the 1,500-person division will concentrate on the consumer, education and small-business markets. Last week Apple introduced the Performa line in Germany, with introductions to come in England, France and Scandinavia later this month.

The region plans to segment its channel so it can "stay competitive with the box movers," Olsson said.

"Our mandate — our company's worldwide — is to increase market share and unit sales," said Olsson, who, like Puette and Floisand, reports to Ian Diery, senior vice president of worldwide sales and marketing. □

Results

From Page 34

► **RasterOps Corp.** of Santa Clara, Calif., said second-quarter sales dipped 7 percent to \$25 million. The company lost \$1.5 million for the period ended Dec. 31, 1992, compared with a profit of \$1 million last year.

► **Adobe Systems Inc.** said sales increased 13 percent to \$70.7 million for its fourth quarter ended Nov. 27, 1992. But profits dwindled 36 percent, from \$13.1 million to \$8.4 million, as a result of an ill-fated real-estate deal.

For fiscal 1992, the Mountain View, Calif., software developer's revenues increased 16 percent to \$265.9 million, but profits dropped to \$43.6 million, from \$51.6 million in fiscal 1991.

► **Symantec Corp.** lost \$4.1 mil-

lion for its third quarter. The Cupertino, Calif., company's sales for the three-month period ended Dec. 31, 1992, were \$48.7 million, down \$9.3 million from the same quarter last year.

► **Motorola Inc.** reported record sales and profits for its fourth quarter ended Dec. 31, 1992. The Schaumburg, Ill., company's sales swelled 22 percent to \$3.71 billion, and profits increased 41 percent to \$181 million. The company's annual sales increased 17 percent to \$13.3 billion; profits shot up 27 percent to \$576 million.

► **Intel Corp.'s** earnings for its fourth quarter ended Dec. 31, 1992,

more than doubled to \$428.6 million on a 54 percent increase in sales.

For fiscal 1992, sales for the Santa Clara-based company increased 18 percent to \$5.84 billion. Profits rose 30 percent to \$1.07 billion.

► **U.S. Robotics Inc.** of Skokie, Ill., announced sales for its first quarter ended Jan. 1. were \$33.1 million, an increase of 33 percent from the same quarter a year ago. Profits were up 41 percent to \$3.3 million.

► **IBM Corp.'s** fiscal 1992 sales were flat at \$64.5 billion. The Armonk, N.Y., company lost \$4.97 billion because of massive restructuring costs. □

NeXT

From Page 34

too many vice presidents here for a company of this size," he said, adding that management downsizing is done.

In addition, van Cuylenburg said the company has implemented a series of changes that will refocus NeXT from a builder of integrated workstations that compete with Macs and Sun workstations to a system software vendor. The goal is to establish NeXTstep, its system software and programming environment, as a mainstream operating system that runs on multiple hardware platforms, he said.

"This is clearly a time of transition at NeXT," van Cuylenburg said. "[Jobs and I] wanted to put pressure on various parts of the business, and not everyone who was on the management team nine months ago has reacted favorably to those new pressures."

The key to the realignment is NeXTstep 486, an implementation of NeXT's current operating system that will run on Intel 486-based machines. Van Cuylenburg said the

software will ship by summer.

However, industry observers and company insiders question NeXT's new strategy. Slade, the company's former marketing head who is now vice president of special projects at Asymetrix Corp. of Bellevue, Wash., said Jobs and van Cuylenburg have taken NeXT from one tough market — computer hardware — into an even tougher market — system software. "How many successful operating-system vendors are there?" he said.

"Everything depends on NeXTstep 486," said a source close to the company. "It's really a do-or-die situation. They have to figure out how to expand beyond the current market for NeXT machines, and it is not clear that they know how to do that."

In related news, NeXT reported a \$1 million operational profit on sales of \$45 million for its fourth quarter ended Dec. 31, 1992. But analysts said the company would have reported a loss if it had included interest payments it makes to Canon Inc., its Japanese investor. □



Business BRIEFS

Monotype exonerated in ITC suit

Seattle — Monotype Typography Inc. last week scored a major victory in federal court here in its legal battle with International Typeface Corp. over some widely used fonts.

An 11-member jury unanimously ruled that Monotype did not breach its contract with ITC when it began marketing a set of 35 fonts in 1991, including 10 that compete with ITC typefaces.

New York-based ITC had claimed in its 1991 lawsuit that Monotype was contractually prohibited from selling "weights or versions" of ITC fonts.

Monotype Typography of Surrey, England, has a library of more than 2,000 typefaces that it licenses to companies such as Apple and Adobe Systems Inc. It is providing Microsoft Corp. with the core TrueType typefaces for Windows 3.1.

EFI, Learning Co. to offer stock

San Francisco — A pair of Mac developers who went public last year announced their intentions to offer stock last week.

Electronics for Imaging Inc. said it plans to sell 2.5 million shares of common stock.

In a filing with the Securities and Exchange Commission, the San Mateo, Calif.-based networking software company said 1 million shares will be offered by the company and 1.5 million shares will be offered by shareholders.

EFI's stock was off 50 cents at \$19.75 per share in NASDAQ trading last week.

Meanwhile, The Learning Company of Fremont, Calif., said it has filed with the SEC to offer 1.3 million shares of common stock. The software company's stock was down \$1.25 to close at \$20 in NASDAQ trading last week.

Apple adds Diery, Forsyth to executive team

Cupertino, Calif. — Apple last month announced two additions to its Executive Management Team, which sets the company's strategic directions.

The company named Ian Diery, senior vice president of worldwide sales and marketing, and Gerald "Fred" Forsyth, senior vice president of the Macintosh Systems Division, to the team of eight. They join, among others: John Sculley, chairman, CEO and chief technology officer; Michael H. Spindler, president and chief operating officer; and Joseph Graziano, chief financial officer.

"These appointments underscore the strategic importance of our core personal computing business as Apple continues its transition to a multiple business family," Sculley said in a statement.

This does not, however, affect the chain of command. Diery and Forsyth continue to report to Spindler.

Networks

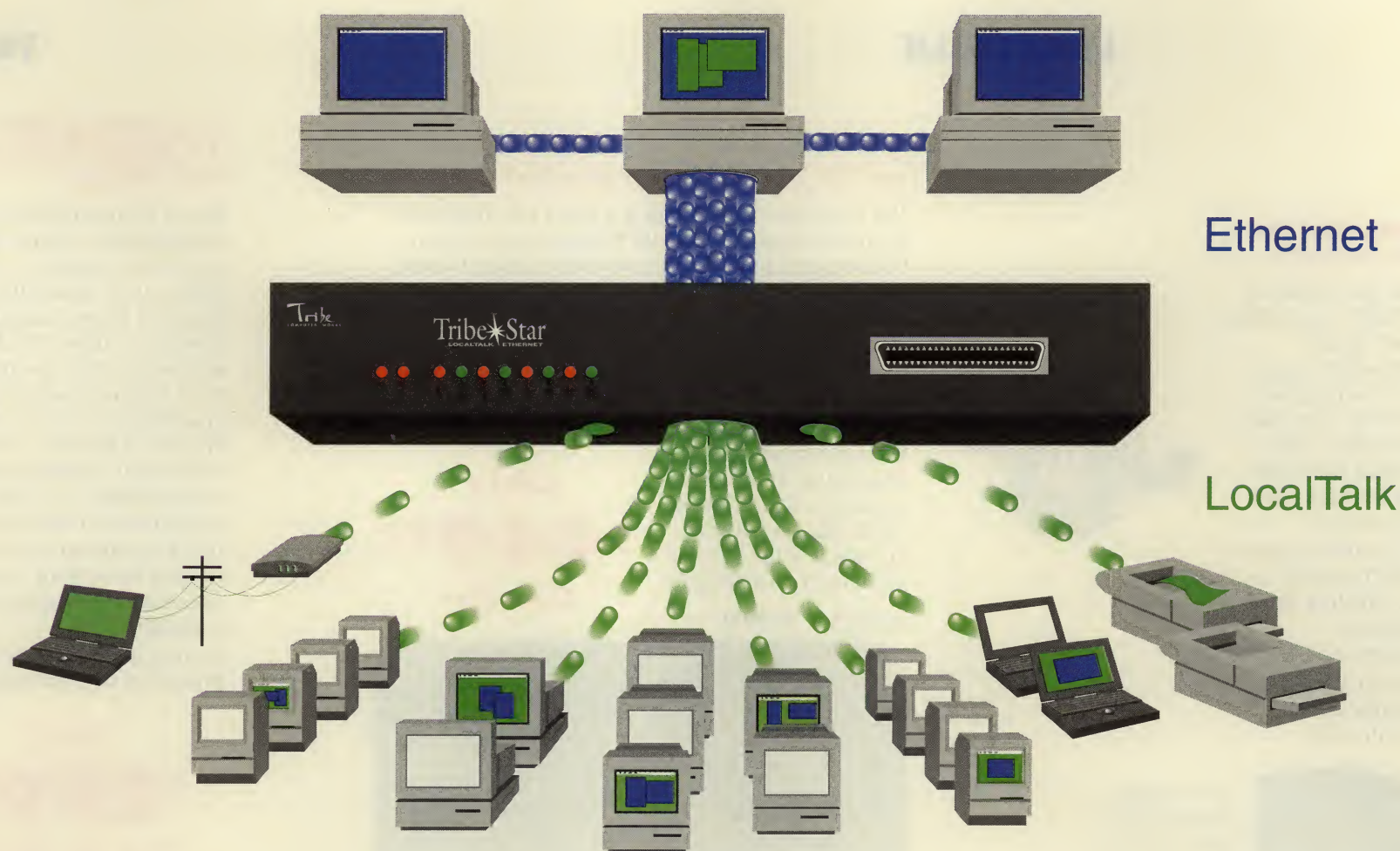
From Page 34

Apple CEO John Sculley and other leaders of the Microelectronics and Computer Technology Consortium, an industry research facility based in Austin, Texas, have lobbied hard on Capitol Hill since Congress convened last month.

On Jan. 19 Sculley testified before the House Telecommunications and Finance Committee in favor of infrastructure investments. The House will have to consider its own version of the National Competitiveness Act before the legislation can become law.

"There is a priority bill for Sen. Hollings and Majority Leader Sen. George Mitchell (D-Maine)," a Hollings staffer said. "There is also a group of Republicans who are interested in technology and tax policies that are good for industry, so there's broad support." □

Four Times Faster Server Access



Question: What is TribeStar?

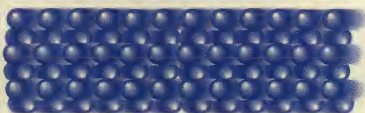
An AppleTalk network hub with eight LocalTalk ports and one Ethernet port. TribeStar can handle eight simultaneous full-speed connections between users and servers. A StarController or a StarController-router combination can only handle one at a time.

Question: How does it speed up server access?

With an all LocalTalk network or a standard LocalTalk-to-Ethernet router, the stream of packets between users and servers looks like this:



With five microprocessors and an 80 Mbps internal backplane, TribeStar opens up eight concurrent channels between LocalTalk and Ethernet. If you put your server on the Ethernet side of TribeStar, the stream of packets in a busy network looks like this:



TribeStar handles up to eight times more packets per second than LocalTalk or a standard StarController-router combination.

TribeStar LOCALTALK ETHERNET

Question: OK, but how much does it REALLY speed me up?

Glad you asked. In a network of 15 to 30 users, it's not unusual to have eight people accessing a network service at once. In this case, TribeStar is about four times faster than LocalTalk or a StarController-router combination. (See graph.)

All Ethernet	12 sec.
TribeStar	22 sec.
Hub+router	85 sec.

Time to complete eight simultaneous downloads of a 200 KB file from a Macintosh IIsi running AppleShare.

Question: Impressive. What else is it good for?

It doesn't just improve server access. Installing TribeStar is like building a roadway between Ethernet and LocalTalk that is eight times wider than what a router provides. Requiring virtually no configuration, TribeStar creates one network that includes both Ethernet and LocalTalk. Switch-Monitor management software comes with it.

Question: How much is it?

TribeStar lists for \$1795. Compare the alternatives:

TribeStar	\$1795
Hub+router	\$3290
All Ethernet	\$8840

Approximate cost for a 25-node network. All prices are list.

Question: Wow. Why should I ever buy a StarController or a router?

Hmmm. Can't think of any reasons.

Question: OK, must be about time for the phone number.

510-547-7800

Call us. We're happy to discuss your network situation. We'll also send further information, including a disk that demonstrates how TribeStar works.



Tribe
COMPUTER WORKS

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The TurboStar™ active hub is a smart LocalTalk Hub at an even smarter price. Its 16 ports support up to 64 users and it interfaces easily with existing twisted pair networks. Includes advanced management software and the new Net Utilities by Tech Works for complete network analysis.

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"Easy to interface... excellent software." MacWeek

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Product # 90 2400 Internal PB

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14.4 Fax/Modem

Internal version for PowerBooks available at the same low price.

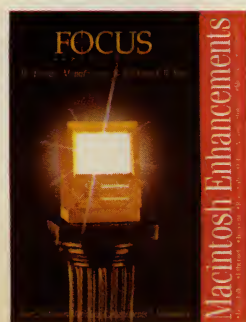


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At only \$99.99, it's as affordable as it is compatible.

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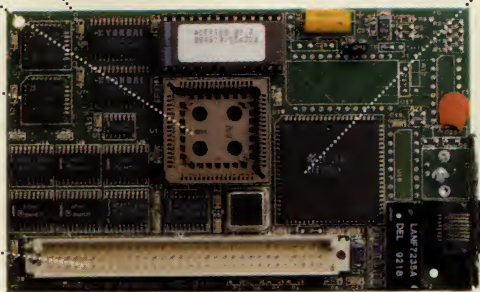
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EDITORIAL

Putting multimedia in perspective

Multimedia — for years touted by its boosters as the Next Big Thing, yet scorned by skeptics as a solution in search of a problem — finally has become serious business on the Mac.

Just as Apple predicted, the release of QuickTime has increased the tempo of development in the field. Along with a slew of start-ups specializing in mixed media, major Mac companies that made their names and fortunes with everyday products, such as displays and hard drives, have placed their chips on the emerging market.

These trends have produced a steady stream of impressive new hardware and software tools, at last making it possible to create presentation-quality multimedia on the desktop, and at a fraction of the cost of traditional solutions (at least this side of the Commodore Amiga).

All that said, Mac managers — and vendors, starting with Apple, that hope to sell managers on multimedia — should be realistic about what the technology requires and who needs it.

Achieving the professional look required by corporate

communications is still an expensive proposition demanding skill, time and the most advanced hardware. And the fact is that most customers in business, education and government use their computers to write reports, manage data and message numbers; producing video-based presentations and training materials is still a function for specialists.

Boosters often compare multimedia to desktop publishing. But they overlook a fundamental difference: Desktop publishing gave users better, cheaper and more effective ways to do what they were already doing — generating paper documents. Multimedia is something only a relatively small number of users do today, and we don't think even better and cheaper tools will change that.

We are delighted to see the progress Mac multimedia is making. But managers wondering whether the time has come to buy into this expensive technology still need to look beyond the hype and make a critical assessment of the role it actually plays in the business environment of the mid-1990s. □

Commentary

The digital ether, coming soon to a PB near you

As technology changes go, the shift from analog to digital is one of the more believable. It also is one of the most promising, if we buy into the mobile technologist's vision of the ubiquitous device for connecting and computing.

The change is sustained by the self-interest of the cellular operators. They are licensed to use a crowded and expensive commodity: the radio-frequency spectrum. Digital encoding of radio transmissions multiplies the capacity of the existing cellular network by about a factor of three, without costly changes to the infrastructure.

To users, digital doesn't necessarily mean a dramatic improvement in sound quality. After all, we still have land lines to contend with. The connection will be cleaner, but voices will sound slightly altered and a slight background hiss will be heard.

One of the most valuable improvements born on the digital wavefront will be increased privacy. Digital encoding of a

conversation will make eavesdropping much more difficult than it is today.

Goin' mobile. Support for higher-speed and more reliable cellular data transmissions will be another digital boon. Once we have a mobile digital link, connecting computers on the move will be much easier.

Indeed, the network will support at least 9,600 bps. Logging onto a cc:Mail server or CompuServe in the airport or on the beach will be a breeze. Digital cellular will make even wireless AppleTalk Remote Access (ARA) a reality, with the reliability of connections rising to the point where persnickety ARA won't crash every few minutes, as it sometimes does with analog cellular.

The vanishing point. But just emulating what we currently do with a modem limits the ultimate potential of this technology.

Just as analog cellular telephones maintain the connection as you move, the cellular data-packet network, once you're logged on, will keep a channel open. But with digital, it takes only a small fraction of a full channel for handshakes at regular intervals and hand-overs to the next cell as the client moves.

And when said client needs the bandwidth to ship data, it's there instantly. This is a proven way of optimizing network usage; it

plays well in this new medium limited by the crowded radio-frequency spectrum.

As a result, you no longer have to call your home network; you're connected anywhere, any time. Your computer is permanently swimming in an ether of radio packets.

Well, almost. There are details such as battery capacity and cellular network coverage. Actually, the network prefers you be constantly on the move, for fear of having you settle down in a local null (an area where the network signal is weak).

Imagine sending and receiving files with your PowerBook just like at home. No more problems with cellular phone etiquette, either. Your messages, schedule changes and faxes arrive in your portable without further ado.

As digital cellular unfolds, it will be interesting to watch what it will favor most: better iterations of existing life forms such as PowerBooks and their Windows cousins; new categories represented by Newton and personal digital assistants from EO Inc. or General Magic Inc.; or buff Sharp Wizards.

There is even a chance that the answer will be all of the above. □



JEAN-LOUIS GASSÉE

LETTERS



StuffIt creator disputes safety of file-compression products

I am compelled to respond to the outrageous claim in the Soapbox "Myths about compression need to be cleared up" (MacWEEK, Jan. 4) by Terry Morse and Lloyd Chambers of Fifth Generation Systems Inc. Specifically, I am referring to their statement regarding compression and reliability.

It is inaccurate and misleading to say that compressing a file with AutoDoubler, or with any other product, actually improves its safety because "since fewer disk blocks are used to store a compressed file, the chance that the file is stored over a bad block is reduced."

In any modern compression scheme, redundancy is reduced to such a point that a small amount of damage (anywhere from a single bit to a few bytes) is likely to render the remainder of the compressed file badly damaged. To damage 10 percent of a 100-Kbyte uncompressed file, 10 Kbytes or more of data must be damaged. Let us assume that every 2 bytes compresses to 1 byte for simplicity, so the file is compressed to 50 Kbytes. Now, to damage 10 percent of the expanded file, a minute amount of damage within the first 45 Kbytes suffices.

It is clear that 45 Kbytes is a much more vulnerable target than 10 Kbytes.

While data compression is a reliable technology, the line of reasoning put forth by Chambers and Morse is nothing more than a marketing ploy and an insult to intelligent MacWEEK readers.

*Raymond Lau, author of StuffIt Deluxe
Forest Hills, N.Y.*

Set HyperCard free to grow; Claris has bigger fish to fry

In his Mac Manager column "Hey Apple: HyperCard does not need to die" (MacWEEK, Jan. 18), Don Crabb said that many groups need HyperCard. I want to concentrate on only one: education. HyperCard works in K-12, college and even graduate school. It's easily learned and used by teachers and students to create useful educational products, both one-time projects and projects that can be built upon and added to year after year like a living school history book. There are 105,000 public and private schools and 9,000 colleges in this country. An entire issue of MacWEEK easily could be devoted to just what education is doing with HyperCard (not BASIC, not Logo). I have two teaching friends who run their own tiny HyperCard cottage industries. They won't make millions of dollars (they don't even yet make thousands), but they are working at a program level they can understand and that many schools around the country actually use.

HyperCard is not for people who work eight hours per day with elaborate spreadsheets, databases or 3-D graphics animation,

so naturally HyperCard doesn't fit conveniently into long-term financial projections at Apple or Claris Corp. Apple has bigger fish to fry, and that's all good. So why not let HyperCard go, free to continue to develop within its own corporation? Let it live for those of us who want to continue breathing life into it.

*Michael Langthorne
Associate director, educational media
University of Notre Dame, Indiana*

Add Catalog Maker to the list of Mac production applications

Both large and small producers of catalogs and circulars are increasingly coming to rely on Mac-based desktop systems as their primary production tools. While this trend has been noted widely in the catalog industry press, it seems to have been overlooked in Mac circles until quite recently.

It was therefore a pleasure to read the story "Catalog producers opt for increased automation" (MacWEEK, Jan. 4) about Mac-based catalog production. This strong, well-researched story gives MacWEEK readers a glimpse of what promises to be the most important development in catalog production since the first mailing list was offered for sale.

However, there is one item that needs clarification. The story states that "there are two tools available that facilitate the import of data into page-assembly programs," suggesting that there are exactly two such "tools." This is simply not the case. Adding Integrated Software's Catalog Maker to that number raises it to three, and there are others, including Frame Technology Corp.'s long-lived FrameMaker.

Because Catalog Maker was designed specifically for catalog production, it can perform a variety of needed functions, such as having a change in one catalog spread reflected in all associated spreads. Catalog Maker uses a simple text interface to move information from a database to a QuarkXPress document. It rapidly can revise any or all of the images, prices or copy in a catalog and is "smart" enough to know when to make the same change in more than one place. Catalog Maker already is being used to produce ads, catalogs and circulars such as Hechinger Inc.'s weekly newspaper supplements.

A general article of wide scope inevitably will omit some products. That oversight was unfortunate in this case only because Catalog Maker so clearly is a tool that catalog makers are looking for.

*Shah Karim, managing director
Integrated Software, New York*

Send letters to MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105. MCI 323-1203; fax (415) 243-3650. Include your name, address and phone number. Letters should not exceed 300 words. We reserve the right to edit for clarity and length.

The Mac Manager

Look to PowerPC Macs for smartware solutions



DON CRABB

Apple is betting the farm on PowerPC Macs. Because these RISC-based Macs offer the twin seductions of considerably more raw computing horsepower and lower cost of manufacture than CISC (complex instruction set computing) Macs, they've rightly got our friend in Cupertino in passion's grip.

This is OK by me. The PowerPC architecture offers hardware and software developers platforms on which to build the smart applications and hardware products that I have been postulating for years.

These smartware products are coming. Developers already are working on a new genre of software and hardware to leverage the PowerPC Mac's many benefits.

Structure of computing revolutions.

It's not the RISCness of the PowerPC Macs per se that will create smartware. If all that were so, Sun Microsystems Inc. would be selling 20 million SPARCstations a year.

Instead, it's the combination of RISC along with Apple's user-interface work, its intelligence in building upon the system a block of functionality at a time and the *relative sanity* of its overall system architecture that gives Apple the smartware lead.

That means Mac managers can forget about Windows NT, forget about the latest OSF version of Unix and forget about OS/2 giving you smartware solutions — at least for the moment.

Instead, concentrate your strategic planning resources for 1994 and beyond on the PowerPC Mac and its native-mode system. This is where smartware is going.

Multiprocessing is the key. One of today's smart products is Radius Inc.'s RocketShare multiprocessing software. With RocketShare, you turn each 68040

Rocket CPU board in a Mac into a separately addressable processor.

This technology allows for CPU-intensive tasks, such as rendering or digital filtering, to be handled on a separate CPU, while other Rockets or the Mac CPU go about the main business at hand.

Multiprocessing (including using specialized digital signal processing chips) already has gotten some software vendors to "wise up" their applications to work transparently in such environments, doing the dirty work in the background, while still allowing the user control over foreground operations.

But Radius hasn't cultivated an industry-wide multiprocessing smartware revolution. It doesn't have Apple's market clout, and it's stuck with relatively pricey multiprocessing solutions based on 680x0 CISC chips.

Consider, however, RocketShare for the PowerPC Mac. With it, Radius could make RISC and DSP-based boards that would cost much less than CISC-based Rockets, yet offer much greater task-specific throughput.

Take that a step further. Apple will want to get into the act eventually. What about a \$3,000 1996 model PowerPC Mac with eight processors? The system and its applications would know which CPU to use for which purpose. Smart, very smart.

Naturally, the first generation of PowerPC Macs won't show much of this. Let's be honest, we'll just be happy if we have working native-mode versions of Microsoft Word and Excel and Claris FileMaker Pro. But look beyond those initial growing pains to where the PowerPC technology will lead us in 1996 and beyond: smartware all the way. □

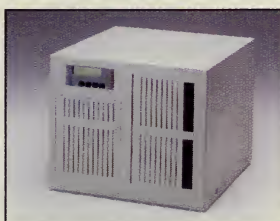


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form•Z now solid on surfaces

auto•des•sys mixes its original polyhedral solid modeler with a new surface modeler for a package that stands above the rest.

score card

form•Z

auto•des•sys Inc.
Version tested: 2.1.2
List price: \$1,495*
Overall value ♦♦♦♦

This release of form•Z turns the polyhedral solid modeler and renderer into the best, though not quite the fastest, solid-and-surface modeler on the market. Most of the 21 new tools are for creating and editing 3-D curves and NURBS (nonuniform rational B-spline) surfaces. Two tools — Stitch and Trim — put form•Z in a class by itself, and the Terrain tool finally makes site modeling easy. form•Z now reports volumes and surface areas, but engineering properties such as the moment of inertia and center of gravity are still missing. The rendering and carving speedups and the interface changes have made form•Z much easier to use, but it still lacks editing tools for combined solids and uses a hardware copy-protection device.

Performance ♦♦♦♦
Features ♦♦♦♦
Ease of use ♦♦♦♦
Documentation/support ♦♦♦♦

*Upgrades to Version 2.1.2 from versions previous to 2.0 are \$195; \$65 for owners of 2.0 or later.

R A T I N G S K E Y

♦♦♦♦ Excellent
♦♦♦♦ Very good
♦♦♦ Good
♦♦ Fair
♦ Unsatisfactory

By Timothy E. Johnson
form•Z 2.1.2 from auto•des•sys Inc. solidly integrates its original polyhedral solid modeler with a new surface modeler. The \$1,495 program stands apart from its competitors with its capability to trim surfaces with solids and to transform surfaces to solids and vice versa.

Many architects and engineers use solid modelers because these programs let them design naturally. A solid modeler can carve up solids and assemble the pieces into larger volumes. Engineers like to carve voids in housings to hold components, and many architects prefer to create rooms and other spaces by subtracting volumes from a solid structure.

Surface modelers, by contrast, are additive — they define shapes by their skins, not their volumes. Rooms, for instance, are assembled from intersecting slabs and walls. Some surface modelers edge into a solid modeler's province by supplying a special tool for carving holes with other surfaces.

The solid advantage. A solid modeler needs only three basic tools for sculpting solids: Add, for welding intersecting objects; Difference, for carving one solid with another; and Intersection, for producing the common volume shared by two intersecting objects. But designers can't live on solids alone; surfaces are useful as construction aids and as free-form, paper-thin objects.

What's new. Most of form•Z's 21 new tools are for creating and editing 3-D curved and NURBS (nonuniform rational B-spline) surfaces. The best tool of the lot stitches intersecting surfaces together to form solids.

form•Z creates primitive shapes like most other modelers: You draw a curve in a plane and then extrude it, revolve it or draw it along a curved axis into the third dimension. You'll find several new tools for quickly orienting the drawing plane with the mouse or the keyboard. You work in a single view — a top, front or side view — or from any perspective.

form•Z has the necessary snap tools for locating surface centers, edges and vertexes. You can even align objects by their edges or faces. In previous versions, form•Z's numerous dialog boxes for setting

tool options were found on menus, rather than with the tools they controlled. This made it difficult to find the dialog box you wanted. Version 2.1.2 neatly solves the problem by making the dialogs directly accessible from the associated tool. Click on a tool with the Option key down and you bring up the proper dialog.

Version 2.1.2 offers new palettes for prompts, keyboard input, naming views, managing 3-D layers and storing drawing planes. The new tear-off, pop-out tools let you position your most-often-used tools near the action on large screens.

The powerful Rounded Corner tool will round selected objects, faces, edges or vertexes according to the radius you type in. The tool also will round a sequence of edges that form a curve if the curve lies in a plane.

All-terrain vehicle. Architects especially will appreciate the Ter-



This architectural model rendered in form•Z shows the capabilities of the polyhedral solid modeler. Note the windows created by subtracting intersecting solids from the main solid.

rain tool for automatically forming solid site models from a series of contour curves. Site modeling is easily one of the most time-consuming tasks an architect faces when describing a project on a computer. And form•Z's new Terrain tool breaks this bottleneck.

You start with a digitized site map, where the contour curves are

represented as a series of line segments. You then merely type in the height difference between contours and click on the curves in order of ascending height. You view the result either as a smooth mesh or as a series of steps that follow the original contours, like a terraced hillside.

See form•Z, next page

Adobe's SuperATM can fake fonts on the fly

By Bruce Fraser

Adobe Systems Inc.'s SuperATM is the latest-and-greatest version of the indispensable Adobe Type Manager utility.

The \$149 product offers the first real look at Adobe's much-ballyhooed document-portability technology. In addition to the usual ATM functions — creation of smooth bit maps from PostScript outline fonts for screen display and output to non-PostScript printers — SuperATM contains an entirely new feature: automatic intelligent font substitution for fonts that aren't installed on your system.

We should state immediately that this isn't the font substitution known and hated by desktop publishers everywhere, where carefully chosen and spaced type is rendered as badly spaced, jagged Courier. Instead, SuperATM uses two read-only multiple-master fonts, Adobe SerMM and Adobe SanXMM, to substitute type that closely matches the aesthetic and exactly matches the metrics of the missing font.

Moreover, it does so automatically, with no intervention on the part of the user, provided that the application in use supports the fea-

ture. And fortunately, a good number of them do, including:

- Microsoft Word (versions 4 and 5) and Excel (versions 3 and 4).
- Aldus PageMaker 4.2 and FreeHand 3.1.
- QuarkXPress 3.1.
- Adobe Illustrator 3.2.3.
- Claris Corp.'s MacDraw Pro 1.5 and FileMaker Pro (versions 1.0 and 2.0).
- T/Maker Co.'s WriteNow 3.0.
- Fifth Generation Systems Inc.'s

Suitcase II 1.12 and Suitcase 2.0.

This is a representative list, not an exhaustive one. SuperATM also is compatible with any system version higher than 6.0.5.

There are limitations. Most of them are well-documented by Adobe, but a few are not. First, PostScript-clone printers that can't print multiple-master fonts won't be able to print documents containing substituted fonts since these are

See SuperATM, next page

score card

SuperATM

Adobe Systems Inc.

Overall value ♦♦♦♦

Version tested: 1.0

List price: \$149*

SuperATM is more than just the latest version of Adobe Type Manager. It provides the first real experience of Adobe's document-portability strategy by using two multiple-master fonts to simulate in a document fonts that aren't installed on your system. The simulations exactly match the widths and closely approximate the overall typographic quality of the real thing. Substitution isn't as seamless as we'd like it to be, but the shortcomings are largely cosmetic, and the process is both truly automatic and remarkably robust. The list of supporting applications is large, and it includes common productivity, publishing and graphics applications.

Performance ♦♦♦♦
Features ♦♦♦♦

Ease of use ♦♦♦♦
Documentation/support ♦♦♦♦

*Upgrades from earlier versions of ATM are \$49.

SuperATM

From previous page

instances of multiple masters.

Apple's Personal LaserWriter NT has the same shortcoming — an upgrade to the NTR is necessary to use multiple-master fonts.

Second, SuperATM works only with Adobe fonts: If the original font came from another vendor, you're out of luck; the document will appear in whatever font the application uses as a default. We'd like to think this limitation is more than just shrewd marketing on Adobe's part.

Installing SuperATM is as straightforward as anything else that uses the Apple Installer. If you usually get two simultaneous messages asking you to insert a particular disk, you'll get them too, until Apple fixes that particular Installer problem. Typing Command-period makes the bogus one from the system go away and allows you to proceed with the installation as intended.

Minimum system. To run SuperATM, you need an SE or higher, with a minimum of 2 Mbytes of RAM under System 6 or 4 Mbytes of RAM under System 7.

You will need 4 Mbytes of free disk space to install SuperATM. The font database that takes care of all the metric-matching magic is 1,425 Kbytes; the two ATM files themselves account for 285 Kbytes; the Multiple Master screen and outline fonts take a further 210 Kbytes or so; Adobe Type Reunion 1.1 takes 50 Kbytes; and a Font Builder application takes another 55 Kbytes. The rest is needed as overhead for the Installer; you get it back once the installation is completed.

We noted that after installation we were left with an Installer Temp folder containing the old versions of ATM, Type Reunion and the Multiple Master INIT, which it seems are no longer required. We weren't sure if the folder should have been deleted automatically or not, and the documentation and read-me files had nothing to say on the subject. Deleting the folder manually did no harm.

SuperATM requires a minimum RAM cache of 128 Kbytes for font substitution to work reliably. The default setting is 256 Kbytes, but if you use large numbers of fonts, you may want to use a higher setting.

SYSTEM 7 COMPATIBILITY

SuperATM 1.0

Balloon help	No
TrueType	No
Publish and subscribe	n/a
Apple events	n/a
32-bit addressing*	Yes

*According to vendor.

The manual recommends an allocation of 256 Kbytes for font substitution, plus 50 Kbytes for each font used (remember that bolds and italics are separate fonts).

How it works. Automatic font substitution works transparently in those applications that support it. The only clue that it's taking place is that the cursor changes to a spinning lowercase "a" while it's happening. The substitute fonts, which exactly match the widths of the original, are installed automatically in your system. However, they are deleted when you restart the Mac, for space reasons.

We'd like to see some way of deleting the temporary fonts from the ATM control panel. If you open a document for which you have the font, but you inadvertently forgot to install it, you have to get rid of the substitute fonts before you can install the real thing, which involves either restarting the Mac or rooting around in the System folder.

In applications that use fractional widths as an option, such as Microsoft Word, fractional widths must be turned on to get accurate line breaks. A further limitation on font substitution comes from ATM itself. ATM allows you to preserve either character shapes or line spacing. If you opt to preserve line spacing, the ascenders and descenders of some characters are sometimes clipped when you print to a non-PostScript printer.

But if you preserve character shapes instead, some applications, notably Microsoft Word, will change the line spacing. The work-around is to specify an absolute line-space value in Word, rather than relying on auto-spacing. This isn't really Adobe's fault, and the work-around is well-documented in the manual.

In applications that fully support SuperATM, the substitute fonts appear on the font menu with a diamond symbol beside them to indicate that they aren't the real font.

However, only three applications — PageMaker 4.2, QuarkXPress 3.1 and Adobe Illustrator 3.2.3 — currently are able to add substitute fonts to the menu instantly. In other applications, the font won't appear on the menu until you quit the application and reopen it.

This situation should improve in the future. For now, it's a relatively minor annoyance. And if all you want to do is view or print the document, it isn't a problem at all.

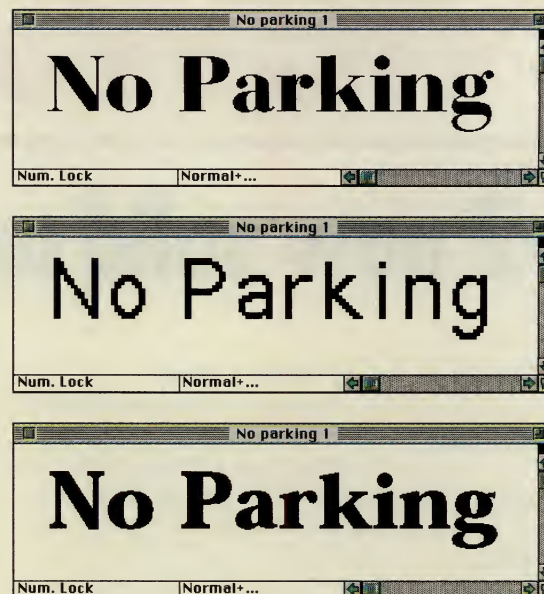
Reliable substitutes. Font substitution seems remarkably robust for such a complex process, even in tricky situations. For example, we created a FreeHand document with type inside a clipping path, then exported the image in Encapsulated PostScript form. We

then removed the font and placed the EPS file in QuarkXPress 3.1. Font substitution worked perfectly both on the screen and in print.

SuperATM offers one other useful feature: It lets you create substitute bit-map fonts containing the correct metrics at different sizes. You can do this in one of two ways. The simplest is to install a single size of the bit-map font, whereupon SuperATM automatically creates any other size you call for. Adobe's Type On Call CD-ROM is included in the package, and while the outline fonts are locked until you pay for them, the bit maps are free, so you have access to more than 1,500 bit maps on the CD-ROM.

The second way is to use the Font Builder utility, also included in the package. Font Builder contains a database with metrics information for 30 Adobe typeface families, most of which contain multiple styles. You can choose a face from the database, then create a suitcase containing the substitute fonts or add the substitute fonts to an existing suitcase.

The resulting suitcase acts just like any other screen font, save that it's identified as a substitute font in font menus by the diamond symbol.



These screen shots show the effects of SuperATM in Word 5.0. The top headline is 72-point Bodoni Bold with ATM turned on and the fonts installed in the System folder. The middle headline shows Apple's standard font substitution when the font is not installed and ATM is not running. The bottom screen was created from an Adobe multiple-master font using SuperATM.

Conclusions. In all, SuperATM is both an impressive achievement and a good deal, particularly with the inclusion of Type On Call and the latest version of Adobe Type Reunion. The automatic substitution features work well (while not as transparently as everyone would like) given the inherent complexities.

The list of supporting applications also is impressive and likely to

grow, and the minor incompatibilities and assorted glitches are documented thoroughly.

This is the first real sign we've seen that the notion of document portability is more than just a buzzword.

Adobe Systems Inc. is at 1585 Charleston Road, P.O. Box 7900, Mountain View, Calif. 94039-7900. Phone (415) 961-4400 or (800) 833-6687; fax (415) 961-3769. □

form•Z

From previous page

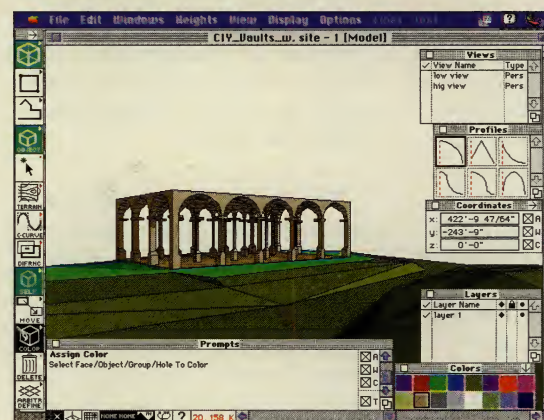
Since the site is a solid model, excavation simply becomes a matter of carving up the site with forms that match the project's footprint.

Editing tools. form•Z has superb editing tools, but they work only on noncombined solids. We wish the program could best Autodesk Inc.'s AutoCAD solid modeler at this game and translate, rotate and scale individual components in a composited shape. With form•Z, you must first decompose the solid into its member primitives before you can edit.

A good solid modeler will form a clean intersection from two identical volumes that have a sliver in common. form•Z passed this test when the overlap was formed by shifting one volume about the other, but we found that the intersection wouldn't always work if one object was also slightly rotated.

Surfaces on a solid footing. The new 3-D curve and surface tools let you choose among an unusually large number of curve types. There are NURBS, B-splines, Beziers, cubics and simple parabolas. For anything but parabolas, you also get to control the curve's stiffness and its affinity with its control points.

Curve and surface editing is very simple. You don't have to worry about outlining a surface correctly while you mold a shape. You can use the Trim tool to clip off tempo-



This design was built atop a topographical terrain map created with form•Z's Terrain tool. Many of the other new features in form•Z shown here pertain to creating surfaces that can be combined to form new solids.

rary surface edges with other surfaces and solids, or better yet, with curves drawn over the surface.

Rather than just defining shapes by stretching a surface over a series of ribs, you also can build surfaces by pushing a rubberlike mesh into shape with a mandrel, or fistlike core. This is much more intuitive than dragging individual control points like other modelers do, because you are deforming a surface area, not just a point. You can control whether the surface clings to the mandrel or spaces away as you push your custom-designed core into the mesh.

You can leave a doubly curved surface paper-thin or ask form•Z to skin over the edges with faceted planes to form a solid. But you don't always have to plan ahead. The new Stitch tool makes a solid out of intersecting surfaces that form a closure, a feature that makes it easy to create very complex solids from a variety of surfaces. These "castings" behave like any other

solid when tooled by the Add, Difference or Intersection operators.

Forming a query. There's a new Query tool for reporting a solid's volume and surface area. Though form•Z tests to accuracy greater than nine places, you have to remember that it bounds all its solids with polygons (rather than continuously curved surfaces). Your answers become accurate only when you approximate a curved shape with a large number of small planar facets. You do this indirectly by specifying how many line segments make up an edge-defining curve.

Some competing solid modelers gain high accuracy by modeling solids with continuously curved shapes. They do this by limiting you to primitives formed from analytical shapes such as cones, spheres, donuts and cylinders. form•Z, meanwhile, places no restrictions on your shapes.

Analytical solid modelers used to See form•Z, Page 46

Charting an organized course

OrgChart Express has rich feature set

By James McAlister

With the release of OrgChart Express, Kaetron Software Corp. seeks to simplify the often tedious process of creating organizational charts, a job that has been relegated to object-oriented drawing programs such as Claris Corp.'s MacDraw Pro and Deneba Software's Canvas.

OrgChart Express has a number of features that help streamline the creation and maintenance of organizational charts and diagrams. While a chart created with OrgChart Express has the appearance of having been created in a drawing program, there's a lot more than drawing under the surface of this \$199 application.

The basic chart object is the tile, a box that contains standard organizational chart data such as name, title and department. Each tile is a visual representation of a record from the database that underlies each chart.

This database contains two kinds of information: personal and positional. Positional data, such as job title, will not change if a new person is put into a job, but personal data is tied to a specific individual.

Both data types are necessary because a person may play several roles in an organization. For example, the financial vice president also might serve as a special task force leader, thus supervising two different groups of people. This would mean two separate tiles (having the same personal data but different positional data) on the organizational chart. Roles make this possible without duplicating a person's personal information.

Creating a chart. Chart creation begins by defining the database fields and specifying whether they contain personal or positional information. First and last names

are creatively segregated for maximum formatting flexibility.

A new chart opens with a single tile displayed. With it selected, you can use the Create palette to add subordinates, co-workers or assistants in the proper hierarchical relationships. You also can generate "free agents," individuals whose relationships will be established later. Methodically working through the organization eventually should produce a chart with the proper hierarchy, even though it may not have the desired layout.

Relationships between tiles, or links, are shown as connecting lines. The most basic link connects one tile to another, and where a supervisor has more than one subordinate, these links are combined into a "group bar." Two or more tiles connected by a group bar comprise a workgroup, which can be subdivided into other workgroups if necessary to depict actual working arrangements.

Importing personnel data.

If you already have personnel data in a word processor or database, you can save the information in text format and import it into OrgChart Express. If you use an outliner such as Symmetry Corp.'s Acta or Symantec Corp.'s MORE, you can save data in an "outline text" format that preserves hierarchical information. Kaetron has done a nice job with the import dialog box, allowing you to view the records to be imported and match the data to fields defined in the OrgChart file.

When OrgChart Express imports records, the corresponding tiles are created automatically. When a file in an outline format is imported, the created tiles even will have the proper hierarchy, although you probably will have to rearrange them. The program also subdivides imported names into their component parts.

While you can enter data directly into tiles, the program lacks a means of global search and replace. Chang-

ing something like a department's name requires that each usage be individually located and modified. Free agents and other tiles whose links have been broken must be linked manually. Manual links sometimes cause tile placement to shift.

Two types of links must be created manually: The "co-manager" link allows two supervisors to share responsibilities, and the Auxiliary link establishes such responsibilities as "dotted-line" relationships.

The right look. You usually can get charts to appear the way you want, but getting there requires a different approach than you would use with a drawing program. For example, moving a supervisor's tile will move the subordinates, so tweaking tile placement is not as straightforward as it might seem.

If the default routing of connecting lines is not satisfactory, you can choose alternate routing schemes for subordinate links, assistant links and auxiliary line paths. There are some limitations, but we didn't find them objectionable.

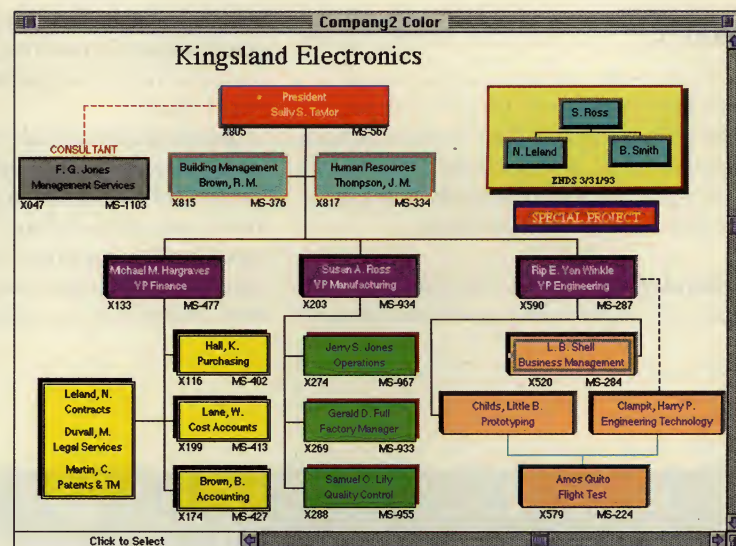
Links can be broken with either the Delete key or the Clear command if you need to rearrange tiles. Also, the Scissors tool can be used to snip a link with greater precision. However, it does not work on all types of links.

You have to be careful in breaking links because there is no way to undo a mistake. In fact, the Undo command does not work on a number of critical operations, a shortcoming that Kaetron badly needs to correct.

Embellishments change the basic appearance of tiles. The application includes an assortment of borders and shadows, and it supports both color and gray-scale shading. Once you specify which database fields should be displayed in a tile, this and all of the other formatting become part of a style in the Style Gallery palette. You can use various styles to differentiate parts of the organization or accomplish special formatting needs. Whenever you change a style, the modifications flow through to all tiles using that style.

There are several options for setting the size of tiles, ranging from a uniform size to matching the size of a selected tile. Tiles where text is too large to fit are specially marked, and you can expand the box with a command. Multiple tiles also can be merged into one box.

There is not a grid for positioning, but you can nudge objects in either one- or 10-pixel increments. A set of alignment commands also helps get things right.



Kaetron's OrgChart Express uses a variety of tile styles to differentiate parts of an organization. In the example above, the Special Project represents an additional role for each person assigned to it. OrgChart Express' Single Record Editor, at right, is activated by double-clicking on a tile. This person has two roles. The pop-up name editor segregates a name's component parts.

Other features. One of OrgChart Express' real fortes is its ability to reassign people. Dragging one tile onto another with the Command key depressed reassigns the person being dragged, leaving the position-related data intact. Holding down the Option key and dragging creates a new role for that person without having to re-enter personal data.

You can print all of a chart, the selected portion or a previously defined Category (a group of tiles meeting a set of criteria, such as all engineers). Print Preview works, but there is no zoom function for a closer look. An assortment of zoom options works well for normal chart operations, but we did find some slight differences in what you see and what you get. Since people can appear in more than one location, you can subdivide the organization to facilitate printing, perhaps putting each department on a separate page.

OrgChart Express can export records in either plain text or outline formats. A chart, or a portion of one, also can be exported as a PICT file or copied for use in another program. We really would like to see the program support System 7's publish and subscribe feature, however.

If your chart contains sensitive information in its database, you can password protect the file. Two types of password access are available, Owner and Guest. Owners can view and change all aspects of a document, while Guests can view only the charts and have no access to the underlying database.

The documentation is generally helpful, although the indexing could

be improved. While there are good sample files, there is no real step-by-step tutorial, although Kaetron plans to add one. There is a brief but effective on-line help system, and technical support is excellent.

Conclusions. Overall, we found OrgChart Express to be a very good program that generally does what it's supposed to do. While some enhancements — such as a workable Undo command — are definitely needed, the basic feature set is deep enough to handle almost any organizational situation.

OrgChart Express' strengths, including its comprehensive links, very good import features and personnel-adjustment capabilities, clearly differentiate it from the simple organizational-chart functionality found in drawing programs.

Kaetron Software Corp. is at 12777 Jones Road, Suite 445, Houston, Texas 77070. Phone (713) 890-3434; fax (713) 890-6767. □

score card

OrgChart Express

Kaetron Software Corp.

Overall value ♦♦♦♦

Version tested: 1.01

List price: \$199

OrgChart Express is a program for creating organizational charts. It has a rich set of features that allows it to structure almost any work arrangement. The underlying database permits individuals not only to occupy more than one position on the chart but also to be reassigned with ease. Very good import capabilities permit decentralized information gathering. Although lacking an effective Undo command, the program is otherwise well-conceived and effective. Documentation is adequate, and technical support is excellent.

Performance ♦♦♦♦
Features ♦♦♦♦

Ease of use ♦♦♦♦
Documentation/support ♦♦♦♦

SYSTEM 7 COMPATIBILITY

OrgChart Express 1.01

Balloon help	Yes
TrueType	Yes
Publish and subscribe	No
Apple events	Yes
32-bit addressing*	Yes

*According to vendor.

form•Z

From Page 44

be the fastest at carving up solids since all their intersections were known equations. form•Z has overtaken these modelers with its threefold speed increase. Zoom by Abvent (also a polyhedral modeler) is the only solid modeler we've found that is faster.

Rendering. form•Z's renderer isn't meant to compete with products that use tex-

ture maps and material properties to produce photo-realistic scenes. You can specify only a material's color, and you have only a sun for a light source.

Beyond the usual hidden-line and simply shaded views, you may choose either Gouraud or Phong shading to give a smooth look to your faceted shapes. The Phong choice renders smoother-looking results but takes longer. The new version gives you more control over the ambient light so the

shadows don't look as harsh. If you have adequate memory, you can vastly accelerate the creation of subsequent simply shaded views by asking form•Z to save the intersection information.

On the other hand, Phong and Gouraud rendering are slow, and form•Z doesn't let you switch to another application while rendering is under way.

You can export your models to another renderer using form•Z's DXF (Drawing

Interchange File) file-exchange feature. We found 3-D exchanges in both directions were flawless, but the program still has trouble importing 2-D DXF files; text comes in too large.

2-D forms. form•Z includes a stand-alone 2-D drafting program for imports and for detailing 3-D models and sections. The 2-D module is also handy for creating the outlines you'll use in the solid modeler for extruding and lathing.

The 2-D drafting module in form•Z is best categorized as a midrange CAD package. The chained, automatic, linear and angular dimensioning is associative, so dimensions update automatically when you edit a shape. form•Z supports layering, and you can create symbols that behave as instances.

The fonts are real TrueType or PostScript fonts, rather than stroked characters. The redraw speed is respectable — about half the speed of the fastest CAD program. You can trim, join, gap and fillet lines, but similar operations on arcs require several steps.

The 2-D module has languished, however, and few changes have accrued over the past several updates to the package. Tangencies still are defined only indirectly by filleting an arc to two lines, for instance.

Typical of this genre but still inevitably aggravating is form•Z's use of Rainbow Technologies Inc.'s EVE hardware key for copy protection.

Conclusions. form•Z has evolved into a heavy-duty, general-purpose polyhedral solid modeler that can't be stumped; if you can imagine the shape, you can build it with form•Z.

The new version merges surface modeling with solid modeling like no other product has done before. Surfaces transform into solids and vice versa, and you can trim surfaces with solids, not just other surfaces.

The terrain generator relieves a long-standing bottleneck in architectural modeling. For engineers and product designers, the Query tool reports volumes, and the Rounded Corner tool softens vertexes and edges.

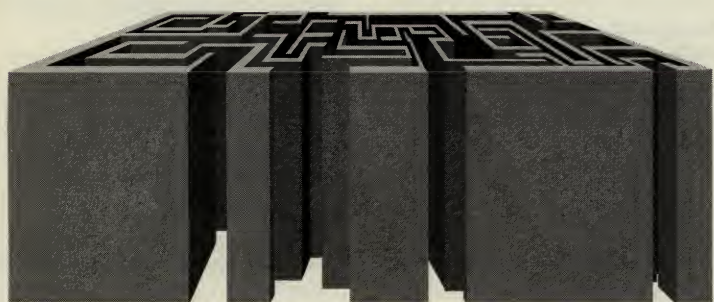
The rendering and carving speed improvements coupled with the interface changes have made form•Z much easier to use.

The only hole in the package is the lack of editing tools for combined solids. You still must decompose an object into its original primitives and make the changes at the component level. Nevertheless, form•Z remains the best polyhedral solid modeler available.

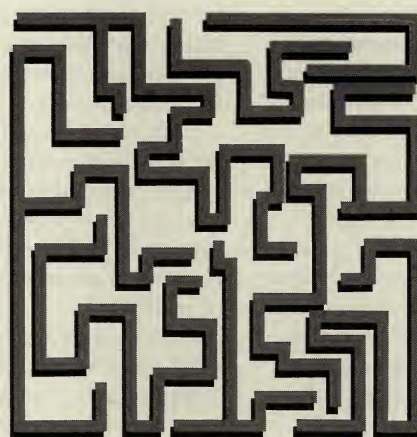
Upgrades to Version 2.1.2 from versions prior to 2.0 are \$195; updates from 2.0 or later are \$65.

auto•des•sys Inc. is at 2011 Riverside Drive, Columbus, Ohio 43221. Phone (614) 488-9777; fax (614) 488-0848. □

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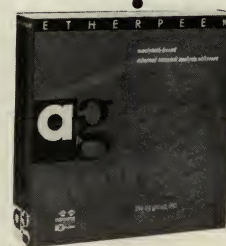
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mac-
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SYSTEM 7 COMPATIBILITY

form•Z 2.1.2

Balloon help	No
TrueType	Yes
Publish and subscribe	No
Apple events	No
32-bit addressing*	Yes

*According to vendor.

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Comparison

Opcode's Audioshop plays a cut above Macromedia's SoundEdit Pro package

Both offerings need further fine-tuning

By Craig O'Donnell

Despite the Macintosh's vaunted sound capture and playback capability, Apple never has provided the full-featured system-level sound editing essential to multimedia producers. Very few programs on the market fill that void.

We evaluated two sound recording and editing packages: Opcode Systems Inc.'s \$89.95 Audioshop 1.03 and Macromedia Inc.'s \$295 SoundEdit Pro 1.0. Our copy of SoundEdit Pro came with Macromedia's MacRecorder input device as the \$349 Sound System Pro bundle.

SoundEdit Pro requires at least a 68020-based Mac and a hard drive. Audioshop runs on any Macintosh with a hard drive. Both require System 6.0.7 and 2 Mbytes of RAM. Our test machines comprised a Macintosh IIci with 20 Mbytes of RAM, a PowerBook 140 with 6

Mbytes of RAM and a IIsi with 17 Mbytes of RAM.

Macromedia's package includes SoundEdit Pro and SoundEdit 2.0.5 (see story, this page) as well as the MacRecorder driver.

Basic features. Both applications offer mono or stereo recording and editing plus special effects. SoundEdit Pro has an optional color-frequency spectrum display. Audioshop can sequence audio CD tracks from a CD-ROM drive (see story, next page).

SoundEdit Pro offers a new multitrack file format. With its disk-based recording and editing, files can be very large (up to half a disk's free space). Audioshop, on the other hand, is structured around multiple Player windows. Sound files and audio CD tracks are grouped into a Player database, or Playlist; multiple Playlists can be open, but tracks to be recorded and edited must fit into Audioshop's RAM partition.

Both editors support numerous file formats, including AIFF (Audio

Interchange File Format), a cross-platform file used by Windows and QuickTime 1.5. Both can install sound into HyperCard stacks or Macromedia's MacroMind Director movies.

Behind the eight-bit ball.

Both applications work with standard monaural Apple audio: "sampling" at 11 kHz or 22 kHz at eight bits with optional compression. Stereo recording, playback and 16-bit sound require additional hardware.

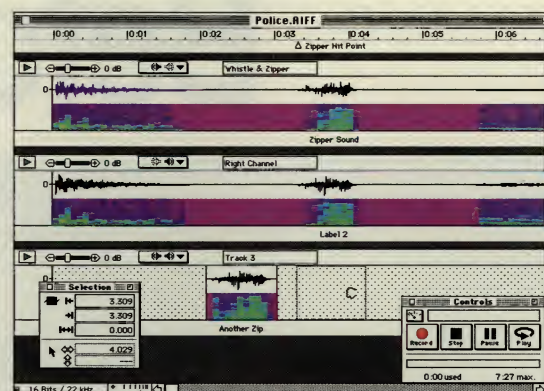
For output, both packages use the Apple Sound Chip, which supports eight-bit stereo playback at rates of up to 44 kHz on most Macs (see MacWEEK, July 27, 1992).

QuickTime tools. Serious QuickTime producers need better audio recording, editing and "sweetening" than that provided by applications such as Adobe Premiere or DiVA Corp.'s VideoShop. Audioshop addresses this need with the capability to create new or open, edit and resave existing QuickTime soundtracks.

Until Apple provides a 16-bit audio card output driver, QuickTime is limited to eight-bit sound. However, Audioshop can install 44-kHz movie soundtracks, audibly better than a typical QuickTime soundtrack. Capturing 44-kHz files, unfortunately, requires Digidesign Inc.'s pricey Audiomeia II hardware or commercial CD-ROM source files. SoundEdit Pro does not recognize QuickTime files.

Importance of input. As with color scanning and digitized video, the input hardware overwhelmingly affects output fidelity. We created test files within both applications using Apple's microphone, the MacRecorder and Articulate Systems Inc.'s Voice Impact serial-port microphone. Tracks recorded with the 1987-vintage MacRecorder fared the poorest; their output was quite dull. Apple's microphone, meanwhile, sounds well-balanced, while the Voice Impact microphone has a bright tone. We encountered no eight-bit recording problems with either program except when using PowerBooks (see story, next page).

Ball of 16-bit confusion. A Macintosh with on-board CD-quality sound and a 16-bit Sound Manager is rumored to become fact sometime this year. But until Apple



With floating palettes visible and all display options active, SoundEdit Pro's interface is confusing. Ordinarily, only the waveform is displayed. The spectrum display is not editable.

delivers a 16-bit output driver, SoundEdit Pro is not actually a "16-bit" application. It opens and performs basic cut, copy and paste on 16-bit AIFF and Sound Designer II files but plays only an eight-bit representation of those files. It cannot output through existing 16-bit sound cards.

It does get halfway there: Using a beta input driver, we successfully created mono and stereo eight- and 16-bit recordings at sampling rates of 22 kHz and 44 kHz with SoundEdit Pro and Digidesign's Audiomeia card.

Audioshop, sadly, is incompatible with Digidesign's cards.

File conversion. Three conversion capabilities are essential to any sound editor: changing types (AIFF file to System 7 file), sample rates ("downsampling" 44 kHz to 22 kHz) and resolution (16 bits to eight bits). SoundEdit Pro shines

here; you can quickly perform all three through a single dialog's pop-up menus. Audioshop automatically converts any 16-bit AIFF to eight bits as it opens the file.

Editing and effects. Both products employ the traditional waveform display: Sound amplitude is shown vertically and time horizontally, with Zoom In and Zoom Out for detail work or coarse chopping. Multiple files may be open simultaneously, and you can select an area with the mouse. Simple functions common to both programs include Cut, Copy, Paste, Undo and Clear.

With all display options activated, SoundEdit Pro presents a daunting interface. Audioshop, on the other hand, has a cleanly designed Editor window with VCR-style buttons.

We prefer Audioshop's direct manipulation; Pro delivers precision but feels clumsy. Its excessively fastid-

score card

Sound-editing software

Low-cost sound editors bridge the gap between Apple's rudimentary Sound control panel and high-end digital sound production software. We looked at two editors that offer mono or stereo recording, editing and special effects.

► **Audioshop 1.03** from Opcode Systems Inc. is an impressive eight-bit sound recorder and editor, compatible with Apple's built-in microphone, Macromedia Inc.'s MacRecorder and Articulate Systems Inc.'s Voice Impact input hardware. It controls audio CD music playback from CD-ROM drives and edits QuickTime movie soundtracks, a unique capability. Whimsical interface aside, it is robust and fast. Despite RAM-based editing and recording, Audioshop wins our recommendation, and its price is hard to beat.

► **SoundEdit Pro 1.0** from Macromedia supersedes the entrenched SoundEdit. It adds multitrack files, disk-based recording and editing, and vastly improved track mixing. It also adds System 7 sound support and basic 16-bit editing but falls short as a "professional" sound editor. Lethargic performance, choppy playback and a yet-to-be-released 16-bit sound driver cripple the product. PowerBook owners should avoid the MacRecorder Sound System.

	Audioshop	SoundEdit Pro
Overall value	◆◆◆	◆◆
Version tested	1.03	1.0
Price	\$89.95	\$295*/\$349**
Performance	◆◆◆◆	◆
Features	◆◆◆	◆◆◆
Installation/configuration	◆◆◆◆◆	◆◆◆◆◆
Ease of use	◆◆◆◆	◆◆
Documentation/support	◆◆◆	◆◆◆

*Upgrade from previous version of SoundEdit, \$75. **Bundled with MacRecorder Sound System Pro.

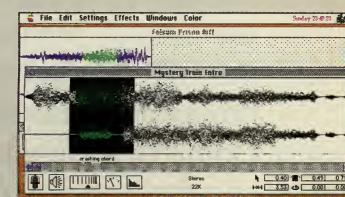
Original SoundEdit remains a golden oldie

The MacRecorder Sound System Pro package from Macromedia Inc. includes SoundEdit 2.0.5. Originally marketed by Farallon Computing Inc. in 1987, SoundEdit 1.0 and its Type FSSD data file instantly became the sound standard. The interface on author Steve Capps' Version 1.0 has aged gracefully; it is extremely direct and Mac-like, with click-and-drag selection; cut, copy and paste; and a powerful Undo.

SoundEdit 2.0 took advantage of System 6.0.7's Sound Manager, adding useful features and accommodating Apple's microphone input. When Macromedia purchased Farallon's sound products in late 1991, Version 2.0.5 provided partial System 7 compatibility.

SoundEdit 2.0.5 supports mono or stereo FSSD, AIFF (Audio Interchange File Format) or resource files. (A little-known feature is that it converts 16-bit AIFF to eight-bit data as the file is opened.) Multiple file windows can be opened, and recording and editing is RAM-based.

SoundEdit cannot open or save QuickTime, SoundEdit Pro or System 7 files. To convert its data



Venerable SoundEdit 2.0.5 has a clean, simple interface. The large icons control recording, playback and level checking. It supports stereo and multiple windows.

files to System 7 format, you can use Alberto Ricci's \$5 shareware Sound Extractor 1.3.1, which is available in the ZiffNet/Mac DOWNTech file library.

Its simplicity and RAM-resident editing make SoundEdit faster than SoundEdit Pro. It does not suffer from the crippling playback pops, stops and glitches that bedevil its newer cousin.

SoundEdit Pro crashes 68000-based machines, while SoundEdit is incompatible with 68040 machines. Including both versions suits all Mac owners, but don't expect future SoundEdit upgrades or documentation. This leaves us to wonder why Macromedia did not simply release SoundEdit 2.0.5 as shareware or freeware. — By Craig O'Donnell

ious modal dialogs slow down work. Audioshop effects include Envelope, to alter volume and allow fading in or out; Bender, to change pitch over time; Crop, to discard all but the selection; Vibrato; and channel Swap, Echo, Flange and Reverse.

SoundEdit Pro includes comparable effects, plus 10 more of dubious utility.

Unaccountably, both products omit four essential professional effects: normalize, auto-fade, file-to-file crossfade and auto-pan. Some of these appear in Garrick McFarlane's freeware Sample Editor 1.0.3.

Master mixer. SoundEdit Pro's new file format contains an arbitrary number of tracks, each with Cue Points and Labels, and each starting at any point in time. The offset cleverly minimizes file size: Without it, each silent track second typically adds 22 kHz of data. Although the files are "multitrack," SoundEdit Pro is not a multitrack digital recorder like Digidesign's Deck or Pro Tools, which perform "simul-sync" recording and mixing.

Instead, Mixing merges tracks into one new file. SoundEdit 2.0.5's rudimentary, bizarre Mix window is gone. With Pro, invoking Mix brings up a dialog to specify stereo or mono output and a destination for the new file. Each track's volume is preset via a fader in its label bar. While workable, control is coarse, and there is no muting option to silence a track even though muting is an essential option.

Bad case of mono. SoundEdit Pro's performance is sluggish. Just 15 seconds of newly recorded 22-kHz stereo took 40 seconds to display. Applying short, simple effects can take more than a minute.

Far too often, playback crackles and skips, which is absolutely unacceptable. Playback is poor, even with short eight-bit, 22-kHz stereo files. Macromedia's suggestion to set Preferences to mono playback is absurd in a "professional" stereo product.

This skipping seemed to be caused by many things, such as moving the mouse or using System 7's file sharing. We called Macromedia but got no acceptable explanation.

Audioshop chops. We were charmed by Audioshop's brazen disregard for the standard Macintosh window. The Player window is undeniably big and busy, but since CD audio control is one of its features, the consumer audio metaphor makes sense and the Player politely shrinks on small screens.

A full Playlist window resembles the Finder's Name view, with track names on the left and information in columns across. In a Playlist, you name CD-audio tracks, sequence tracks to play and select files to edit.

The Audioshop Helper extension aliases SoundEdit data files to Audioshop. Since dropping a group of files onto Audioshop's icon creates a Playlist, this clever gambit simplifies logging and playlisting many pre-existing SoundEdit files from, for example, a CD-ROM. Unfortunately, Audioshop will not

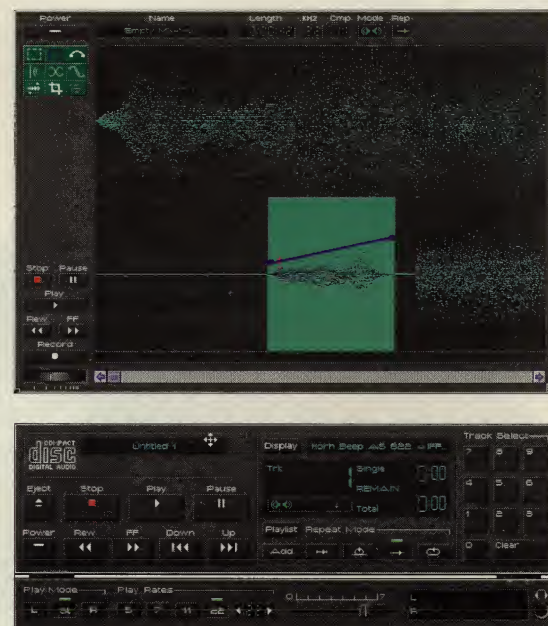
open dropped System 7 sound files, and it has a monomaniacal desire to create new Playlists. These minor annoyances become tiresome. Worse, Audioshop cannot output sound if Apple's Movie Player is open, a conflict Opcode should fix.

Documentation and support. SoundEdit Pro's well-indexed manual is based on the outstanding SoundEdit 2.0 documentation, while Audioshop's manual is adequate. Both skimp on actual applications, recording tips and techniques.

We found both companies' support staff friendly and competent but hard to reach. Phoning Macromedia seemed futile, while Opcode support lines usually are busy. Electronic support is provided via America Online and CompuServe.

Windows X-factor. The Mac no longer has the only graphical interface in town. Turtle Beach Software's \$149 Wave for Windows is an excellent sound editor. It works with eight- and 16-bit sound boards and retains powerful features from the company's professional-audio software. We hope Macromedia and Opcode pay close attention to the competition from smart Windows developers.

Conclusions. Audioshop and SoundEdit Pro are fine for everyday, mono, eight-bit audio editing, but Audioshop is the all-around winner. QuickTime producers need a powerful, fast and flexible editor, and Audioshop comes very close. With both editing and audio CD control, it is clean, useful and fun. Adding effects such as normalize, "mix to



Audioshop has a sparse Editor window (top left). The Envelope tool bar applies a fade-in to the selection in one channel of a stereo QuickTime soundtrack. Audioshop's unconventional Player window (bottom left) mimics a home CD player. The Playlist, which can contain both eight-bit sound files and audio CD tracks, is displayed in the center.

mono" and fading, as well as fixing the drag-drop glitch, would make Audioshop a real success. We recommend Audioshop and the Voice Impact microphone to people with older Macs who want to add sound input to their machines.

Macromedia has positioned Pro as a high-priced adjunct to Director. It performs file conversions well but is ultimately disappointing. Despite enhancements, it simply is not professional caliber. Disk access is far too slow, and the interface needs more work. The program lacks obvious features, and its unpredictable sound playback is inexcusable. Paradoxically, its excellent multitrack file format with the provision to offset tracks in time, then mix, is a stroke of genius.

Semiprofessional sound tools are still not where they should be in a world moving toward QuickTime

and mixed media. We need Apple and third parties to move quickly to give QuickTime users simple, powerful tools to create eight- or 16-bit soundtracks. □

Product Info

MACROMEDIA INC.
MacRecorder Sound System Pro (includes SoundEdit 2.0.5 software): \$349; **SoundEdit Pro 1.0:** \$295 (upgrade from previous version of SoundEdit, \$75)
600 Townsend St., San Francisco, Calif. 94103
Phone (415) 442-0200; fax (415) 442-0190

OPCODE SYSTEMS INC.
Audioshop 1.03: \$89.95
3950 Fabian Way, Palo Alto, Calif. 94306
Phone (415) 856-3333; fax (415) 856-3332

SYSTEM 7 COMPATIBILITY

	Audioshop 1.03	SoundEdit Pro 1.0*
Balloon help	Yes	Yes
TrueType	n/a	n/a
Publish and subscribe	No	No
Apple events	No	Yes
32-bit addressing**	Yes	Yes

*MacRecorder input driver 1.0.2 and SoundEdit Pro are not compatible with virtual memory.

**According to vendor.

Audioshop lays down CD-ROM tracks

Opcode Systems Inc.'s Audioshop Playlists can contain audio CD music tracks. An Audioshop Players window replaces Apple's CD Remote desk accessory.

Insert an audio CD into your CD-ROM drive, and Audioshop prompts you to name the new Playlist and enter track names. The Playlist becomes the audio CD's alias.

CD Playlists are built automatically by inserting a new CD or by cutting and pasting tracks from existing CD Playlists. When neces-

sary, Audioshop prompts you for the next album and ejects CDs automatically. (Interruptions should be minimized if two or three CD-ROM drives are connected.)

Between CD tracks, Playlists can contain eight-bit sound files. When Apple releases a 16-bit output driver, we hope Audioshop is upgraded so that anyone can assemble an entire high-fidelity soundtrack from the desktop with a mixture of CD tracks and prerecorded CD-quality files. — *By Craig O'Donnell*

PowerBooks, System 7 combinations suffer serious sound glitches

ZiffNet/Mac on-line reports led us to investigate alleged MacRecorder-PowerBook compatibility problems. Forum member Stephen Baum reported rhythmic "ticking" when recording files on a PowerBook 100 with System 7.0.1 and Macromedia's SoundEdit 2.0.5 and MacRecorder driver 1.0.2. Others reported "warbling." Baum later posted a message explaining that once he reverted to System 6.0.8 on his PowerBook 100, the ticking vanished.

Examining Baum's "tick-infested" file revealed that about 15 samples were missing from the waveform every half-second. This data loss happens during recording and is audible when playing sustained sounds. We noticed similar distortion on our PowerBook 140.

On a 7.0.1-equipped PowerBook 140 (with virtual memory, AppleTalk and file sharing turned off) we tested Apple's built-in driver and

microphone, the MacRecorder driver 1.0.2 and hardware, as well as Articulate Systems Inc.'s Voice Impact driver and hardware. We recorded with SoundEdit, SoundEdit Pro, Opcode Systems Inc.'s Audioshop, the freeware Sample Editor 1.0.3 and the Voice Record desk accessory.

All this software records cleanly with Apple's microphone. The MacRecorder driver generates "ticking"; the Voice Impact driver sounds crackly. Amazingly, Audioshop's internal Costello driver worked nicely with both MacRecorder and Voice Impact hardware on our PowerBook 140.

We can only conclude that PowerBooks, System 7, and the MacRecorder and Voice Impact sound drivers are incompatible. While SoundEdit and SoundEdit Pro work fine for editing prerecorded sounds, PowerBook owners wanting to use a MacRecorder or



The Sound control panel functions as an input Chooser for built-in and add-on audio hardware.

Voice Impact must buy Audioshop. We suspect PowerBook Duos might have the same problem, but we could not test one. Unfortunately, the jury is still out on the PowerBook 100; Baum reports that Audioshop's Costello driver did not help. — *By Craig O'Donnell*

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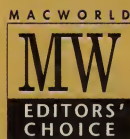
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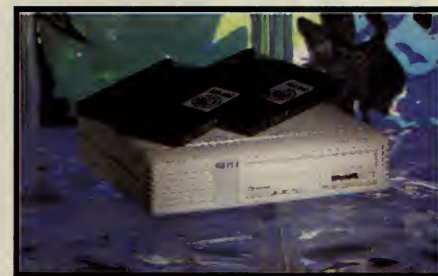
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Macintosh CAM systems make it in manufacturing

From the shop that fabricates space stations to the one that builds Fender guitars, the Mac is finding a useful place on the shop floor.

By Bob Weibel

Macs now play key roles in manufacturing quality control, thanks to the wide range of specialized data-acquisition hardware and software now available.

In fact, pick any manufacturing buzzword — CAD/CAM, rapid prototyping, machine vision, quality assurance — and you'll find the Mac there. Often Macs are competing with, and in many cases besting, far more complex and expensive Unix workstation and mainframe-based manufacturing hardware and software. Here we give a sampling of Mac applications in each of these areas.

Defining CAM. While CAD software is purely for creating precision drawings, CAM (computer-aided manufacturing) software takes a product design straight to the shop floor for prototyping and final creation.

Many machine shops now have automated milling, lathe, punch and other equipment, such as electronic discharge machines (EDMs), that follow coded instructions known generically as NC (numerical control) code.

The process is fairly straightforward:

A CAM operator works over the CAD design, and using CAM software, figures out how to move a machine's cutters, carefully choosing tool paths and depths to create a finished part from a block of metal, plastic or other materials.

Before adopting the Mac, shop managers had to write NC programs by hand, line by line. Visual Engineering of Plano, Texas, uses the Mac to create consumer product prototypes and the pre-production instrument case work for medical, computer and aerospace companies.

"The Mac's had a significant impact on the amount of time spent on each project," said Tom Hindman, project manager for Visual Engineering. "We stopped writing NC code by hand and began using Macs to create code. It's easily 10 times faster."

Three vendors' products dominate the Mac CAM arena: Aura CAD/CAM Inc.'s suite of products, Gibbs and Associates' Gibbs Systems and NCM Systems' Quicksurf.

Aura CAD/CAM. In addition to its 2-D auraCAD 3.1 package, Aura CAD/CAM also offers specific



BOB RYAN

Steve Watkins, principal of Watkins Manufacturing, displays a few of the objects he has created using Quicksurf CAM software. The gold disk in front of him is a deployment mechanism for a space station antenna array.

ic packages for milling machines, lathes, punches, wood routers and EDM hardware.

Visual Engineering uses Aura's auraMILL, a 2.5-axis milling package. "For a 2.5-axis package, Aura is it," said Hindman, who favors the immediate feedback offered by auraMILL's graphical interface.

According to Hindman, auraMILL displays the part as a centerline graphic and shows a tool path in the diameter of the chosen tool, leaving a filled path around or inside the part. If there is a problem, he can cancel the move easily and try again. "If you get three or four steps into the tooling and then want to change the order of the tool moves, it's quite simple to call them up graphically and change the order," Hindman said.

Bill Carey, president of W.R. Carey Co. of Springfield, Mo., also uses auraMILL to run the three machining centers and a single lathe that produce the company's industrial-strength meat-processing equipment and automotive, aerospace and marine prototyping.

"Aura CAD/CAM has concentrated more on making its system glitch-free rather than investing in too many bells and whistles," Carey said. "Aura software produces flawless NC programs in a format that's second to none. We don't fiddle with it at all." Aura compiles NC programs into the

specific code for controllers built by Fanuc of Japan, which according to Carey, represents about 78 percent of all controllers in the world.

Stressing the importance of efficiently written code, Carey said, "When you run an NC program, you want to run as small a program as possible. RAM on a Mac is about \$40 a megabyte, but on an NC machine 1 Mbyte of RAM costs about \$3,000."

Gibbs System. Gibbs and Associates' ncCAM is a 2.5-axis program such as auraMILL, but the company will soon release Virtual Gibbs, with real-time 3-D modeling that shows the tool actually removing material from the part via a 3-D screen simulation.

Barry Alexander, supervisor of Woodruff Corp. of Torrance, Calif., uses the Gibbs System both for Woodruff's custom-made aerospace products and for designing and manufacturing race-car wheels in his own shop. Alexander said the new Virtual Gibbs has great potential.

"Working without printed documentation, I actually designed a new wheel on Virtual Gibbs in five hours," Alexander said. "You can actually see a solid model in front of you appearing out of the piece of stock and see clearly how the piece will machine." According to Alexander, this makes it easy to

See CAM, next page

Desktop prototypes: From art to part

Turning machines from concepts to reality invariably requires prototypes and working models, usually at least one for every trip back to the drawing board.

Rapid prototyping machines bypass milling and other machining to create elaborate 3-D models out of photosensitive acrylic polymers, thermoplastic filaments and other materials straight from your computer files.

Unfortunately, such systems — from vendors such as Cubital America Inc., Stratasys Inc. and 3D Systems Inc. — cost between \$100,000 and \$400,000 and fill small rooms.

However, for modest projects, you might want to check out Roland Digital Group's CAMM-3 desktop prototypers. Videx Inc. of Corvallis, Ore., uses the CAMM-3 Model 3000 with Gibbs and Associates' CAM software to produce prototype cases for its line of handheld bar-code readers. The \$11,995 CAMM-3 is a 2.5-axis desktop mill best-suited for plastic or wax prototypes.

According to Videx President Paul Davis,

good practical design requires many prototype iterations. "Suddenly the engineers want to put a switch in here, or you find there's a light in the wrong place, so you wind up making more models," Davis said. An outside service would charge Videx about \$4,000 per model.

"If I had to pay for all that hard tooling, a single product model could cost me \$200,000 in prototypes," Davis said. Videx uses a durable wax compound with the CAMM-3. "We do a lot of market testing with the models. We hold it in hand to check its feel, decide if it's too long here or there, and then go back and make a modified one," Davis said.

According to Davis, without the Gibbs System/CAMM-3 combination used at Videx, it, like other manufacturers, would end up living with some design flaws, given the heavy hit of outside model contracting.

"With this system we get all the changes done in the early stages, and we settle on one design, without having to make any changes to the hard tooling." — By Bob Weibel

CAM

From previous page

check for any mistakes or tool interference with clamps or other fixtures in the shop.

Quicksurf. According to users, NCM Systems' Quicksurf has been the system of choice for sculpted 3-D surface machining. Although Carey of W.R. Carey Co. swears by Aura CAD/CAM's system, he keeps Quicksurf on hand for 3-D modeling jobs.

To quickly make metal prototypes, W.R. Carey Co. first designs a part in 3-D using Vellum from Ashlar Inc. of Sunnyvale, Calif. The 3-D Vellum design then is imported into Quicksurf to cut a 3-D mold of the part from soft material. The company injects the resulting mold with wax and then makes an aluminum investment casting where molten metal replaces the wax. This raw casting is then precisely machined using auraMILL's NC data.

Steve Watkins, principal of Watkins Manufacturing in Fullerton, Calif., uses Quicksurf to machine 3-D guitar-neck templates for Fender Electronic Instruments Corp. "I use Quicksurf to draw the shape of the back of the neck and then create an NC program to cut it out of aluminum," Watkins said. "You can see it clearly on screen,

See CAM, Page 56

Having the import blues

All CAM systems on the Mac and other computers can import CAD drawings, usually in DXF (Drawing Interchange File) and IGES (Initial Graphic Exchange Specification) formats. On the face of it, this seems like the way to go since importing a CAD drawing into a CAM system is quicker than redrawing it from blueprints. But many manufacturers we spoke to don't see it that way, for several reasons.

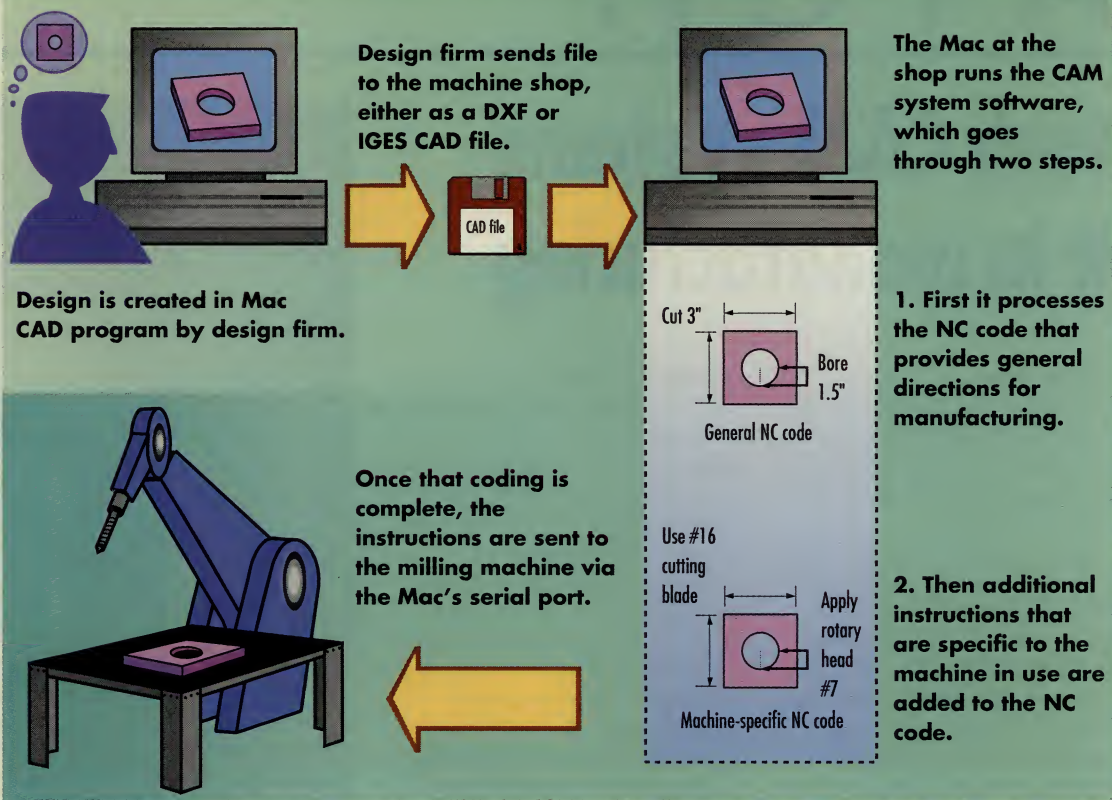
According to Paul Davis, president of Videx of Corvallis, Ore., CAD programs such as Claris CAD and Ashlar Inc.'s Vellum don't actually connect points, say between a line and arc. Close doesn't count as far as CAM is concerned. In Videx's Gibbs System (and other CAM software), a line really must connect. "Otherwise the cutter goes out into nowhere because it doesn't know how to handle the line," Davis said. "It can try to jump to the next one but doesn't know where to jump to."

Davis said that while the Gibbs System has an optional translation program that attempts to connect all the loose ends, it doesn't work perfectly. That's why his company prefers to enter a product design by hand into the CAM system, relying on blueprints or hand sketches.

Steve Watkins, principal of Watkins Manufacturing of Fullerton, Calif., encounters additional problems when working from imported CAD files. "I find instances where dimensions in the CAD file don't match what's on the blueprint," he said.

Watkins said he feels more confident working from his customers' drawings instead of CAD files. Redrawing the part forces him to go over it carefully, often catching a customer's mistakes before they result in wasted time and milling stock. — By Bob Weibel

How Mac-based computer-aided manufacturing works



NEVIN BERGER

Decoding CAM terminology

Here's a brief glossary of common CAM elements.



2.5-axis

► **CAM (computer-aided manufacturing):** While CAD programs aid in product design, CAM programs are actually application generators that produce instructions for automated milling machines, lathes, presses and other types of cutters (see NC entry).

► **DXF (Drawing Interchange File):** This is a proprietary standard developed by Autodesk Inc. of AutoCAD fame. It has become a de facto standard for CAD drawing exchange. DXF is capable of communicating true 3-D shapes. Although 3-D extensions to DXF are arriving, it typically codes 2-D designs.

► **EDM (electrical discharge machine):** This uses an electric wire to corrode hard materials instead of cutting them. It's a slow, but highly accurate process, usually limited to small parts.

► **IGES (Initial Graphic Exchange Specification):** A standard designed for the interchange of graphical, particularly 2-D and 3-D, CAD images. The National Institute of Standards and Technology maintains the IGES standard.

► **NC (numerical control):** These codes drive automated machine tools. The code defines the tool path to be followed and the steps required to make a part on a specific milling machine, lathe, punch or other machining center. The NC code also controls the sequence of cuts and sets the speeds and feeds for each tool pass.

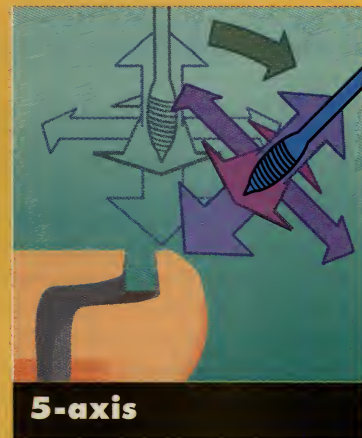
► **NURBS (nonuniform rational B-splines):** Mathematically derived curves used in some CAD programs to help a designer manipulate a curve into virtually any shape. CAM programs supporting NURBS can accurately translate the NURBS math into the parametric formulas required by NC machines.

► **PLC (programmable logic controller):** Small, modular, factory-hardened computer made to control equipment, coordinate machinery and communicate to other PLCs, automated equipment or computers.

► **2-axis:** An NC machine that can move a tool along two axes or dimensions — up and down, or right and left.

► **2.5-axis:** An NC machine that can calculate curves in 2-D, but only straight lines in 3-D. For example, it can move a tool straight up and down to a new vertical position before cutting horizontal curves.

► **3-axis:** An NC machine that can calculate curves in 3-D, so it could cut the top half of a sphere, for example, but it can't undercut to machine the lower half. To do that you must reposition the part.



5-axis

► **5-axis:** An NC machine that can either tilt the cutting head or tilt the part so the tool can get at many angles without your having to change its position. It can machine the upper and lower hemispheres of a sphere, for example, or create pockets on the top and sides of a solid rectangle.

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CAM

From Page 54

and it's mathematically correct."

The curvaceous math entails NURBS (nonuniform rational B-splines) for easier 3-D editing and accuracy. Watkins also uses the Gibbs System for machining parts for the NASA space station and for custom automobiles, reserving Quicksurf for 3-D work.

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The working Mac. Mac-based innovations on the shop floor just keep coming. Assembly Guidance of Burlington, Mass., integrates "ruggedized" Macs, or RackMacs as they are called, from GreenSpring Computers Inc. into a shop-floor model that electronically stores assembly templates and projects them with laser light onto sheet material for cutting or marking.

This reduces the time and expense of storing and using templates. HyperCard-

based A-Plan software from JGI Micro-neering lets you wrap product information into easily understood multimedia displays for assembly-line workers, many of whom aren't trained to read CAD drawings.

Ultimately, users say, it's the Mac interface that makes Mac CAM systems productive, reducing errors and training time. Whatever your application, chances are there is a Mac CAM system that will meet your company's needs. □



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Mac and MORE Specials for February

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	SPECIALS
1 SyQuest  ETC DataDrive 45R SyQuest Removable The most popular removable on the market. All SyQuests come with one cartridge! \$389**	2 ETC DataDrive 88R SyQuest Removable A 4-mice rating from MacUser has made this our best selling drive. \$489**	3 ETC DataDrive 88C SyQuest Removable New from SyQuest, this 88MB removable can read and write 45MB cartridges. \$619**	4 ETC PowerSlide Extended Keyboard  \$99.00	5 1.2 Gigabyte External Hard Disk Drive A reliable drive with a lot of storage room at a very good price. Features ETC Tools. \$1,599**	6 OverStock Specials Big Savings on lots of Macintosh Products Hundreds of unadvertised specials. Call for Fax List! Save BIG!	
7 SII  Seiko Instruments CM-1445 14" Monitor Using Trinitron technology, this 14-inch RGB monitor is over a \$100** cheaper than Apple! \$429**	8 SONY 1604 16-inch Trinitron Monitor Using the Trinitron tube, the SONY 1604 offers a razor sharp image at a great price. \$1125**	9 CLUB 24 	10 ETC DataDrive 128R Magneto-Optical Drive Featuring a Teac 128MB M-0 Drive, the 128R comes complete with one cartridge! \$1,099**	11 PowerBook Batteries That Last 25% Longer New, from BTI, these batteries for the 140/170 have a built-in cover so they won't short. \$79**	12 4MB x 8 70nsec SIMM  \$120	13 IISI 030 Adapter Cards  \$179
14 E-MACHINES  E-Machines T-16 II Undoubtedly, this is the best selling 16-inch color monitor around. Gives you 832x624 WYSIWYG image. \$1,299**	15 1MB x 8 70nsec SIMM  \$29	16 30-day Return Policy On All ETC Products! 	17 SUPERMAC  ThunderStorm Speed up the filters in PhotoShop using the latest in accelerator technology. \$839**	18 SuperMac ThunderStorm Speed up the filters in PhotoShop using the latest in accelerator technology. \$839**	19 ETC DataBeam TCP Thermal Wax Printer A color printer with terrific 300dpi output and a price that is just as sharp! \$3,699**	20 Futura EX Video Cards  \$489
21 SONY 14-inch Monitor The creator of the Trinitron tube, Sony's 14-inch monitor is the standard by which all others are judged. \$659** <small>#1304S</small>	22 DAYSTAR DIGITAL 50MHz PowerCache with Math Coprocessor Drop one of these in your Macintosh and race past everyone else. New Low Price! \$859**	23 QMS QMS 860 HammerHead 11x17 LaserWriter Provides PostScript output on tabloid size paper at an amazing 8 pages per minute. \$4,199**	24 radius Radius Rocket 33 33MHz Accelerator When run with RocketShare, this accelerator is like having a 2nd Mac on your desk. \$1,999**	25 UMAX UMAX UC-630 600 dpi Color Scanner The mainstay for most desktop publishers, this color scanner is easy-to-use! \$1,149**	26 TI PS-17 LaserWriter With AppleTalk At this price, you can't go wrong in upgrading your output to 300dpi with this printer. \$1,249**	27 Kodak Diconix M150 Printer  \$199
28 TOSHIBA New and Fast CD-ROM Toshiba 3401-E This was the hottest CD-ROM at Macworld in San Francisco. 200msec access. \$579**	29 SIGMA DESIGNS  Sigma Designs Power Portalt A three star winner from MW Labs, this 15-inch portalt monitor plugs into your SCSI port. \$639**	30 FUJITSU Fujitsu 520MB Internal Hard Disk One of the fastest drives on the market. External model is only \$1039** \$999**	31 Numeric Keypad for your PowerBook  \$75	32 Quantum 85MB Internal Hard Disk From Quantum From the new ELS family, this economical drive is our best seller. External for \$299** \$239**	33 ETC DataPress Hardware Data Compressor The ETC DataPress is the only hardware data compressor for your Mac. It's 7 to 10 times faster than software compression alone. Plus, it's the first peripheral to expand your SCSI bus. Now you can put more than 7 SCSI devices on one Mac. Need more details? Call Mac and MORE.	

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Time is shaking out glitches in MO drives

Systems-management chores, such as backup and archiving, are made easier with an appliance entering more offices: 128-Mbyte magneto-optical drives.

PRODUCTS

MO better storage. In a review last spring of the first group of 128-Mbyte magneto-optical drives for the Macintosh, we saw some problems typical with new technologies, including software bugs, firmware instabilities and compatibility problems (see MacWEEK, April 27, 1992).

Since that time, the products have settled down, and scores of vendors now are selling them at more attractive prices. A few companies are advertising 3.5-inch magneto-optical drives with capacities of more than 200 Mbytes, but there is not yet an accepted standard for a higher-capacity format, according to Steven Wolsky, a founder and chief operating officer of Optical Access International Inc. in Woburn, Mass.,

which manufactures optical drives.

In contrast, 128-Mbyte drives now all conform to an American National Standards Institute standard, Wolsky said. That means users can interchange cartridges freely among various manufacturers' drives.

Over the months since the review appeared, I have continued to work with the technology. It has proven to be reliable, convenient and cost-effective for chores that we all face: daily backup, archiving and restores. What follows are some notes and tips on two decent drives I have tested.

Setting examples. FWB Inc.'s HammerDisk130 is based on the Panasonic LF-3000, which is the quietest mechanism I have heard.

Street prices on the drive run

about \$1,600, and the company's popular Hard Disk ToolKit software is included. (Hard Disk ToolKit is now at Version 1.2.1. The company does not notify customers of updates, but you can get an update if you return your original floppy.)

APS Technologies sells its Epson OMD-5010 drive direct for \$1,199. The drive spins a little faster than the Panasonic unit, but it also is a bit noisier.

Both products are well-designed, and both mechanisms seem to have a good reputation among manufacturers. (The Panasonic mechanism also is sold by Ricoh Corp. with Ricoh firmware, and the Epson mechanism comes from Olympus.)

There are many similar drives on the market, and since only a handful of different mechanisms are in use, distinctions are mainly in software, pricing, support and quality.

Cartridges for the drives have become standardized, and prices are falling below \$50 per cartridge.

Tests and tricks. The Epson drive performed about 15 percent to 20 percent faster in my tests than the Panasonic unit, but this hardly matters for backup and archiving.

More important is the option, provided by both companies' software, to control write verification. With magneto-optical drives, write verification makes an additional pass over the media to check that data was written correctly. This may be worthwhile insurance, especially for backups and archiving.

Some applications, such as Dantz Development Corp.'s Retrospect, can read and verify data on their own. In this case, using write verification at the driver level only slows things down, and it can be turned off if the cartridge is not used for other purposes. You also can disable write verification for tasks such as recording high-fidelity audio where speed is critical.

Hard Disk ToolKit does not enable write verification by default, and it is important to remember that the Mac must be restarted after turning on write verification before it will take effect.

Another trap is ejecting a cartridge formatted with one utility and inserting one formatted with a different program. The Mac uses the driver loaded from the original cartridge to access the new cartridge, and switching may cause problems, especially if password-protection is involved.

Moving one cartridge among different drives should not be a problem, however. Most formatting utilities install a driver that is compatible with a variety of mechanisms.

Keeping clean. One approach to managing storage is to split your hard drive into partitions, each small

Ask David Ramsey

Duos can go power mad



Q. My PowerBook Duo doesn't seem to be charging the battery fully. Why?

A. According to PowerBook guru and PBTools author Bill Steinberg, the Power Manager in the Duos can "lose its mind" occasionally. To reset it, press and hold the Reset button on the back of the Duo for more than five seconds, release it, then press and hold for more than five seconds again. The Duo should start up when you release the button the second time; if it doesn't, press it once more. This completely resets the Power Manager and gets your battery charging normally.

Q. I've noticed that when virtual memory is disabled after being used for a while, you can examine the invisible swap file with a disk editor and see fragments of unprotected data from the Mac's memory. Isn't this a significant security hole?

A. You're right! Even encrypted files can be accessed if their contents were swapped to disk when in use. I must admit this never would have occurred to me.

Q. What do System Enablers do? Which Macs use them?

A. Prior to System 7.1, every time Apple introduced a new Mac, the company also introduced a revision of the system software to support the new CPU. System 7.1 was written to allow new, CPU-specific features to be added via drag-and-drop software, called System Enablers, which can perform virtually any task, including patching bugs in the system and adding new capabilities.

The Enabler mechanism is not documented; in fact, Apple has not released publicly any technical information on Enablers, even to developers. Because of the potential for abuse (imagine Enabler conflicts the way we have extension conflicts now) and the fact that the mechanism is certain to change in the future, Apple decided to keep Enabler development to itself.

Right now, there are three Enablers: the Mac IIvx requires Enabler 001 (recently updated to Version 1.0.1 from 1.0); the PowerBook Duos require Enabler 201; and PowerBook 160 and 180 require Enabler 111. It's likely that each new CPU introduced will require its own Enabler.

Please send questions to David Ramsey on CompuServe: 76702,335 or to Ask David Ramsey, c/o MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105.

enough to be copied completely to a magneto-optical cartridge. You then have the option of keeping backups in Finder-readable format for convenience, and you can tailor backup schedules to different types of files. A partition holding data files might be backed up daily, for example, while an application partition is backed up less frequently.

One final thing to note about magneto-optical drives: Like CD-ROM drives, they can be subject to

dust problems that do not affect hard drives. Panasonic makes a cleaning kit designed only for its drives. The Epson drive has a different air-flow system, which may be less susceptible to dust problems.

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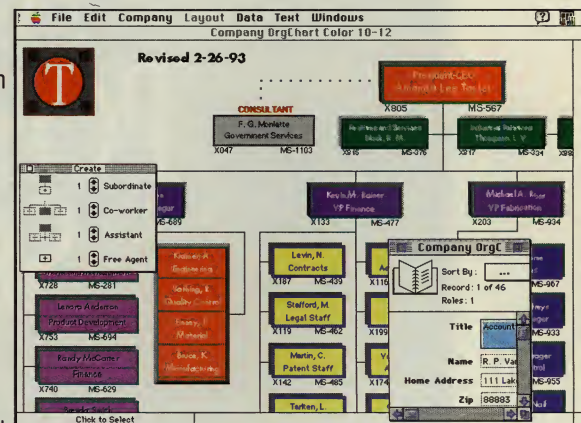
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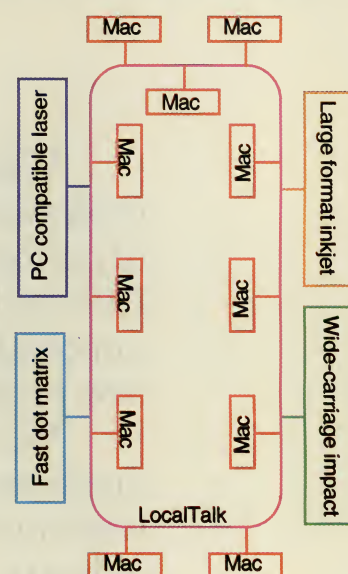
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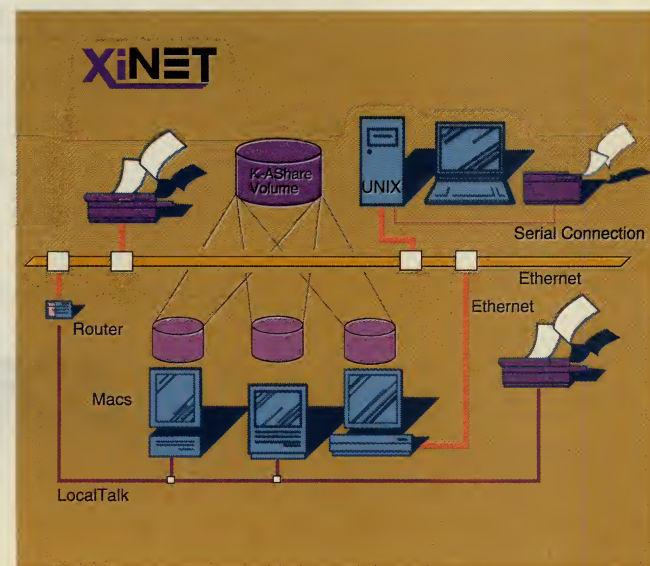
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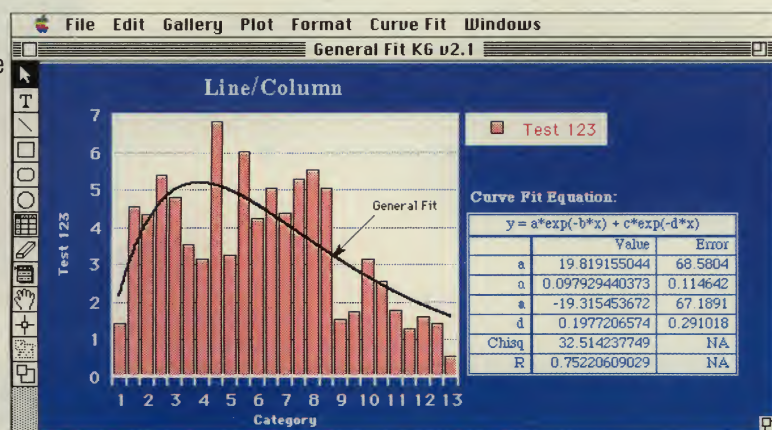
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8-BIT SYSTEM—\$2099.

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• 24XLI
• Accelerated color card \$1699.
• 2075M 20" Multiscan Trinitron
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• Designer System
• 2075M 20" Trinitron w/24XLI
Package Price \$3899.

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• Universal Power Cache
40MHz \$575.

• Universal Power Cache
40MHz w/68882 \$679.

• Universal PowerCache
50MHz \$749.

• Universal PowerCache
50MHz w/68882 \$889.

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• NEW 3FGX 15" MultiSync
Monitor IN STOCK.

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Trinitron System
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E-Machines NEW! T-16
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Magnavox 8/24 Bit Color Bundles
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RELISYS

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Rocket 33 — 33 Mhz '040
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Dove 30 day MBG	
5383.....DoveFax PowerBook	99
Global Village 30 day MBG	
7730.....PowerPort/Bronze Fax Modem	197
7720.....PowerPort/Silver V.42bis Fax	369
7710.....PowerPort/Gold V.32bis Fax	429
Mass Microsystems	
2220.....24/96 Internal Fax Modem	189
PSI Integration 30 day MBG	
5320.....PowerModem	155
6961.....PowerModem II	235
7798.....PowerModem III	329
7786.....PowerModem IV	425
Twincom	
10334.....14.4 PowerTwin internal	299
10333.....24/96 PowerTwin internal	125
Zoom Telephonics 30 day MBG	
10737.....2400/9600 send fax/4800 receive fax	92

Dove 30 day MBG	
6758.....DoveFax Desktop	199
5554.....DoveFax LAN 10 User	399
5539.....DoveFax LAN NuBus 10 User	399
4796.....DoveFax LE	149
9634.....DoveFax Plus	299
4111.....DoveFax Plus for NuBus	299

Global Village 30 day MBG	
2174.....TelePort/Bronze	197
2175.....TelePort/Silver	369
2179.....TelePort/Gold	429

Hayes	
1345.....Optima 2400 - V.42bis	125
5971.....Optima 24 - V.42, V.42bis	145
8187.....Optima 24 + 96 S/R fax - V.32	159
3522.....Optima 9600 V.32 - V.42, V.42bis	349
8168.....Optima 96 + 96 S/R fax - V.32	379
5970.....Optima 96 - V.32, V.42, V.42bis	389
7395.....Optima 144 + 144 S/R fax - V.32	479
8186.....Optima 14,400 - V.42, V.42bis	439
7440.....Ultra 24 - V.42, V.42bis	399
7391.....Ultra 9600 - V.32	599
1610.....Ultra 96 bundle - Smartcom II, Hayes Connect, 9600, V.32, V.42, V.42bis	649
5024.....Ultra 14,400 - V.32, V.32bis	669

Logicode Lifetime Warranty	
1774.....Quicktel 2400X Platinum	79
1775.....Quicktel M1414XV Platinum	299
1776.....Quicktel M9624XV Platinum	149
1777.....Quicktel M9696XV Platinum	289
Mass Microsystems	
3655.....24/96 Fax Modem	165
2280.....24/96 Networkable Fax	349

Twincom	
10335.....24/96 Commuter	122
External 9600 baud send, 4800 baud receive fax, 2400 baud data. Portable (1.5"x4"x3.5") with QuickLink II and STF software.	
10332.....14.4 Pro - 14.4/14.4 S/R	329
External 14,400 bps send and receive fax/data modem. Includes QuickLink II & STF software.	
10337.....14.4 Voyager 14.4/96 S/R	362
Portable, external 14,400 bps data, 9600 bps send/receive fax modem. (12"x4.5"). Includes QuickLink II & STF software.	
10334.....14.4 PowerTwin internal	299
Internal 14,400 bps data, 14,400 send/receive fax modem for the PowerBook. Includes QuickLink II & STF software.	
10333.....24/96 PowerTwin internal	125
Internal 9600 bps send/4800 bps receive fax, 2400 bps data modem for PowerBook. Includes QuickLink II & STF software.	

Practical Peripherals 30 day MBG	
5434.....2400/96 S/R fax w/QuickLink	119
8994.....2400, V.42, V.42bis, MNP4-5	125
3089.....2400 w/ Smartcom lifetime warr	139
9849.....9600 w/Smartcom lifetime warr	349
8063.....14400FX 14,400/9600 S/R fax	419

Prometheus 30 day MBG	
4724.....24/96 fax w/voice, V.42, V.42bis	185
8990.....Ultima Home Office 14,400/9600	375
3232.....Promodem 2400 Mini fax + - 96 fax	119
8350.....Promodem 2400 Mini-M	72

PSI Integration 30 day MBG	
3143.....COMstation One	142
3142.....COMstation Two	247
5340.....COMstation Four	359
6965.....COMstation Five	439

Shiva 30 day MBG	
3443.....NetModem 2400	339
6917.....NetModem V.32 9600	1039
2004.....NetModem/Ethernet (10Base-T)	1475

Zoom Telephonics 30 day MBG	
1168.....AMX 2400 - V.22bis, V.22	63
7757.....FaxModem AFX - 24, 96/S, 4800/R	84
3576.....FX9624V - 24, 96 S/R fax, V.42, V.42bis	127
4698.....VXV.32bis 14,400 - V.42, V.42bis	227
3553.....VXF V.32bis 14,400 fax, V.42, V.42bis	267

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44 MB CARTRIDGES**

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10589.....w/Norton Utilities	649
10591.....w/ Auto Doubler	649

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Include a car-
tridge, cables
and software.

44 MB SyQuest Drives

5533.....44 MB w/Auto Doubler	439
5532.....44 MB w/Norton Utilities	439
5534.....88 MB w/Auto Doubler	539
5535.....88 MB w/Norton Utilities	539

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Accelerators

Applied Engineering 30 day MBG

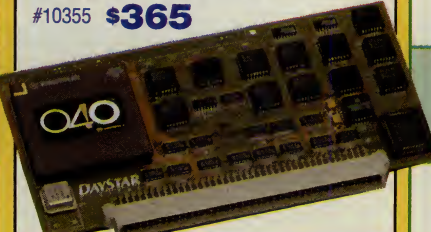
9799.....Cache-In for IICI - 32k cache	189
4850.....FastMath Classic II - 16 MHz/68882 FPU	109
1971.....FastMath LC - 16 MHz/68882 FPU	109
2464.....QuickSilver - 32k cache card/slot extender for Mac IISI	199
2532.....QuickSilver - 20 MHz/68882 FPU for IISI	269
6319.....TransWarp Classic - 16 MHz/68030/ 32k cache/4 SIMM slots	325
7322.....TransWarp - 50 MHz/68030/68882 FPU/64k cache for IICI	899
7321.....TransWarp - 50 MHz/68030/64k cache for IICI	749
6318.....TransWarp Classic - 16 MHz/68030/ 68882 FPU/32k cache/4SIMM sockets	415
4147.....TransWarp LC - 33 MHz/68882 FPU/ 32k cache	529
4903.....TransWarp LC - 40 MHz/68882 FPU/ 32k cache	699
3319.....TransWarp SE - 25 MHz/68030/ 68882 FPU/4 SIMM slots/video slot	569
3317.....TransWarp SE - 40 MHz/68030/ 68882 FPU/4 SIMM slots/video slot	749
8362.....QuadraLink - 4 serial ports on NuBus	269

**Turbo 33 MHz '040
Better Than Quadra Performance!**

NEW #10360 \$1799

FastCache for 040 128k RAM

#10355 \$365



DayStar 30 day MBG

5562.....Combo Cache IISI - 2 PDS slot adapter/ 32k cache/socket for optional FPU	232
3584.....DualPort IISI - 2 PDS slots/68882 FPU	165
3401.....FastCache IISI - 20 MHz/64k cache	299
5559.....PowerMath LC/LCI - 16 MHz/68882 FPU	109
8556.....FastCache IICI - 64k static RAM	223
1613.....FastCache 040 - 128k static RAM for Quadra 700/900	277
8785.....FastCache Quadra - 128k static RAM/ 33 MHz for 700/900/950	409

DayStar Universal PowerCache

8787.....16 MHz/68030/32k cache/Classic/SE	435
8788.....16 MHz/68030/68882 FPU/32k cache	499
1622.....33 MHz/68030/68882 FPU	499
1631.....33 MHz/68030	409
1667.....40 MHz/68030/68882 FPU/32k cache	679
1635.....40 MHz/68030/32k cache	589
1734.....50 MHz/68030/68882 FPU	899
1670.....50 MHz/68030	769
Universal PowerCache Adapter is required for IISI, II, IIfx, LC, Classic, SE, and SE/30	45
Radius	
10314.....Radius Rocket 25i MHz - 25 MHz, 68040 for NuBus, 8 SIMM Slots	1299
2949.....Radius Rocket 25 MHz - 25 MHz, 68040 for NuBus, FPU, 8 SIMM slots	1679
7870.....Radius Rocket 33 MHz - 68040, 33MHz, FPU, 8 SIMM slots	1995

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Business

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Computer

POWERBOOK ACCESSORIES

Applied Engineering 30 day MBG	
8799.....Auto Adapter.....	67
Asanté	
2555.....10Base-T PowerBook SCSI.....	279
BTI	
7562.....Battery 140/145/160/170/180.....	62
10392.....Charger 140/145/160/170/180.....	94
10390.....Starter Pack (Battery & Charger).....	122
Cables	
8459.....HDI30 to Centronics 50 Female.....	45
8461.....HDI30 to Centronics 50 male.....	39
8460.....HDI30 male to DB 25 male.....	42
Connectix	
8441.....CPU PowerBook Utilities.....	49
Dayna	
5396.....DaynaPort SCSI/Link (thin).....	299
5360.....SCSI/Link 10Base-T.....	299
5484.....SCSI/Link thick, thin, 10Base-T.....	349
Eastman Kodak	
3009.....180si portable printer for Mac.....	369
Envisio	
2411.....ColorBook 16/2 MB.....	799
2380.....ColorBook 16/4 MB.....	1019
2268.....ColorBook 16/6 MB.....	1049
2259.....ColorFrame.....	3999
1837.....Notebook Display 030 Adapter 2 MB.....	699
1835.....Notebook Display 030 Adapter 4 MB.....	929
Farallon	
9516.....PowerPath.....	105
Inlign Design	
10731.....PowerBook Tools Software.....	62
Kensington 60 day MBG	
9585.....Executive PowerBook Case.....	125
1118.....Compact PowerBook Case.....	36
1092.....Deluxe PowerBook Case.....	75
5976.....PowerBook Keypad.....	95
NEC	
4146.....CD Express w/ CDR-25.....	429
Sophisticated Circuits	
7425.....PowerPad.....	79
Targus 30 day MBG	
7370.....Business Traveler.....	199
4341.....Premier Notebook Leather Case.....	139
7369.....Notepac.....	35
1305.....Universal Notebook Case.....	69
PowerBook & Duo RAM	
10341.....4 MB RAM Duo 210/230.....	239
10340.....8 MB RAM Duo 210/230.....	447
9446.....10 MB RAM PB 160/180.....	529
9422.....2 MB RAM PB 160/180.....	159
9424.....4 MB RAM PB 160/180.....	229
9426.....6 MB RAM PB 160/180.....	319
9427.....8 MB RAM PB 160/180.....	439
3742.....2 MB RAM PB 100/140/145/170.....	115
5090.....4 MB RAM PB 140/145/170.....	199
5091.....6 MB RAM PB 140/145/170.....	259

RAW DRIVES

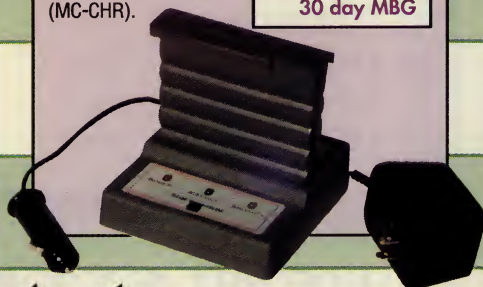


Quantum 2-year warranty	
10413.....42 MB ELS Drive.....	179
10414.....85 MB ELS Drive.....	265
10412.....127 MB ELS Drive.....	319
10411.....170 MB ELS Drive.....	379
10142.....105 MB Pro Drive.....	299
10137.....120 MB Pro Drive.....	335
10131.....240 MB Pro Drive.....	549
10150.....425 MB Pro Drive.....	899
10130.....525 MB Pro Drive.....	1039
10145.....700 MB Pro Drive.....	1215
10147.....1050 MB Pro Drive.....	1499
10141.....1225 MB Pro Drive.....	1649
10148.....80 MB Go Drive for PB.....	339
10134.....120 MB Go Drive for PB.....	459
Connor 1-year warranty	
10358.....84 MB Drive.....	225
10357.....120 MB Drive.....	335
9266.....209 MB Drive.....	439
10469.....540 MB Drive.....	979
All drives come with FWB Hard Disk ToolKit software.	
Bracket w/cable (specify computer).....	
Bracket w/cable/Quadra.....	

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The Starter Kit includes a high-quality replacement battery (MC-170) along with a portable conditioner/charger (MC-CHR).

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Removable Media

5118.....Iomega - Bernoulli 2 Cart 44 MB.....	99
4276.....Iomega - Bernoulli 2 Tripak 20 MB.....	179
5113.....Iomega - Bernoulli 2 Tripak 44 MB.....	279
2530.....Iomega - Gold Std 90m Cartridge.....	149
2467.....Iomega - Gold Std 90m Tripak.....	439
2509.....Iomega - Tripak 20 MB.....	265

Floppy Disks

3297.....Sony 3.5" 800k Disks.....(10).....	9
6148.....Sony 3.5" 800k Disks.....(30).....	25
3298.....Sony 3.5" FDHD Disks.....(10).....	15
6375.....Sony 3.5" FDHD Disks.....(30).....	42
2214.....Fuji 800k Disks.....(10).....	9
2242.....Fuji 800k Disks.....(50).....	32
7379.....Fuji FDHD Disks.....(11).....	14
2241.....Fuji FDHD Disks.....(50).....	59
2243.....Fuji 800k Color Disks.....(10).....	10
2239.....Fuji FDHD Color Disks.....(10).....	16

High Density Disks

Fuji 11 Pack Pre-Formatted \$15 #7758

Optical Media

2865.....PLI - 21 MB Floptical Cart.....(1).....	27
6767.....PLI - 21 MB Floptical Cart.....(5).....	125
2899.....PLI - 21 MB Floptical Cart.....(10).....	245
3016.....PLI - 512 MB -5.25" Media.....(1).....	159

Komag Optical

128 MB \$39 #10439	
10439.....Komag - 128, 3.5" Optical.....(1).....	39
10440.....Komag - 128, 3.5" Optical.....(3).....	109
10442.....Komag - 128, 3.5" Optical.....(5).....	175
10441.....Komag - 128, 3.5" Optical.....(10).....	339

Tape Media

3943.....3M - 40 MB Tape Cartridge.....	17
1603.....Sony - DG60m DAT Tape Cartridge.....	16
2520.....Sony - DG90m DAT Tape Cartridge.....	22
7671.....TEAC - 60 MB Cartridge.....	16
7672.....TEAC - 150 MB Cartridge.....	24
7673.....TEAC - 600 MB Cartridge.....	36

21 MB Floptical Drive

Read & Write:
DSDD/HD DOS **\$369**
1.44 HD Mac #2864



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Dataproducts 960

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10326.....Dataproducts 1560 11x17.....	3195
10318.....Dataproducts 960.....	1695
10319.....Dataproducts 965.....	2595
1880.....CoStar - LabelWriter II Plus.....	239
1884.....CoStar - LabelWriter II Mac.....	185
6514.....HP - DeskWriter B&W.....	479
2964.....HP - DeskWriter 500.....	599
7665.....HP - DeskWriter 550C.....	795
8368.....HP - LaserJet 4M.....	2249
5377.....NEC SilentWriter Model 95.....	1439

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44 MB \$61.50 ea.
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5912.....44 MB Cartridge (1).....	65
9728.....44 MB Cartridges (10).....	615
3603.....88 MB Cartridge (1).....	99
3600.....88 MB Cartridges (10).....	950

Solutions

Quantum



GO•Drives have 32k cache, low power consumption, MTBF of 150,000 hours, and ONE Year Warranty. ELS drives have 32k cache, low power consumption, MTBF of 250,000 hours and TWO Year Warranty. LPS drives have 64k-256k cache, MTBF of 250,000 hours, and TWO Year Warranty. PRO drives have 256k cache, MTBF of 150,000 hours, and TWO Year Warranty.

Unformatted Capacity	Model	Access Time	Actual MAC Capacity	Internal	External
GO • DRIVE (2.5" HARD DRIVES DESIGNED FOR NOTEBOOKS)					
80mb	GO80	17ms	80mb	\$325	\$425
120mb	GO120	17ms	120mb	\$455	\$555
NEW 160mb	GRS160	17ms	160mb	\$549	\$649
ELS SERIES (3.5" LOW PROFILE AND LOW POWER)					
42mb	ELS42	19ms	40mb	\$185	\$245
85mb	ELS85	17ms	82mb	\$235	\$295
127mb	ELS127	17ms	124mb	\$305	\$365
170mb	ELS170	17ms	160mb	\$345	\$405
LPS SERIES (3.5" LOW PROFILE)					
240mb	LPS240	10ms	234mb	\$515	\$575
525mb	LPS525	10ms	500mb	\$1045	\$1105
PRODRIVE SERIES (3.5" HALF HEIGHT)					
425mb	PRO425	9ms	406mb	\$899	\$959
700mb	PRO700	10ms	670mb	\$1245	\$1305
1.0GIG	PRO1050	10ms	1001mb	\$1525	\$1585
1.2GIG	PRO1225	10ms	1165mb	\$1695	\$1755

Maxtor



Unformatted Capacity	Model	Access Time	Actual MAC Capacity	Internal	External
XT SERIES (3.5" LOW PROFILE)					
120mb	7120S	15ms	121mb	\$269	\$329
207mb	7213S	15ms	202mb	\$389	\$449
LXT SERIES (3.5" HALF HEIGHT)					
330mb	LXT-340	15ms	324mb	\$639	\$699
535mb	LXT-535	12ms	510mb	\$975	\$1035
XT-8000 AND PANTHER SERIES (5.25" FULL HEIGHT)					
645mb	XT-8760S	16.5ms	639mb	\$1179	\$1279
1.2GIG	PO-12S	13ms	997mb	\$1429	\$1529
1.7GIG	P1-17S	13ms	1433mb	\$1729	\$1829

Maxtor 3.5" drives carry a ONE Year Warranty. Maxtor 5.25" drives carry a TWO Year Warranty.

Seagate

Featuring...
the ELITE SERIES



Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
3.5" DISK DRIVES						
248mb	ST3283N	Low Profile	12ms	235mb	\$479	\$539
1.2GIG	ST11200N	Half Height	10.5ms	1000mb	\$1535	\$1595
WREN AND ELITE SERIES (5.25" FULL HEIGHT)						
645mb	ST4767N	Wren Runner II	11.9ms	634mb	\$1519	\$1619
1.2GIG	ST41200N	Wren-7	15ms	989mb	\$1399	\$1499
1.6GIG	ST41651N	Wren-8	15ms	1350mb	\$1795	\$1895
2.1GIG	ST42100N	Wren-9	12.9ms	1900mb	\$2099	\$2199
1.6GIG	ST41600N	Elite-1	11.5ms	1307mb	\$2029	\$2129
2.4GIG	ST42400N	Elite-2	11ms	2050mb	\$2919	\$3019
3.4GIG	ST43400N	Elite-3	11ms	2750mb	\$3929	\$4029

Seagate drives carry a ONE Year Warranty.

FUJITSU

FIVE YEAR WARRANTY



Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
425mb	M2623FA	3.5" Half Height	9ms	405mb	\$899	\$959
520mb	M2624FA	3.5" Half Height	9ms	496mb	\$989	\$1049
1.2GIG	M2266	5.25" Full Height	14.5ms	1029mb	\$1529	\$1629
2.0GIG	M2652	5.25" Full Height	14.5ms	1665mb	\$2495	\$2595

HEWLETT PACKARD

FIVE YEAR WARRANTY



Unformatted Capacity	Model	Access Time	Actual Mac Capacity	Internal	External
3.5" HALF HEIGHT DRIVES					
234mb	C2233	12.6ms	223mb	\$799	\$859
422mb	C2235	12.6ms	402mb	\$1049	\$1109
1.2GIG	C2247	10.5ms	1000mb	\$1975	\$2035
5.25" FULL HEIGHT DRIVES					
677mb	97556	13.5ms	633mb	\$1465	\$1565
1.2GIG	97558	13.5ms	1020mb	\$1665	\$1765
1.6GIG	97560	13.5ms	1292mb	\$1995	\$2095
2.4GIG	CP3010	11.5ms	2000mb	\$3099	\$3109



ClubMac 88c will allow you to read and write both 44mb and 88mb cartridges. Finally, there's one simple solution. Buy the drive that will offer complete compatibility with all SyQuest based cartridges. Buy the ClubMac 88c.



ClubMac SyQuest Dual Drives offer users the most convenient way to exchange data between cartridges.



Internal SyQuest Technology, essential for every Quadra 900/950, IIfx, IIfx and Performa 600 user, is available from ClubMac TODAY!

CLUBMAC 88c REMOVABLES*

ClubMac 88c External (SQ5110C)	\$619
ClubMac 88c Internal	\$599
ClubMac 88c Dual	\$1149

* ClubMac 88c will read and write 44mb cartridges, but will not format 44mb cartridges.

CLUBMAC 44MB REMOVABLES

ClubMac 44mb External (SQ555)	\$389
ClubMac 44mb Internal	\$369
ClubMac 44mb Dual	\$729

CLUBMAC 88MB REMOVABLES

ClubMac 88mb External (SQ5110)	\$489
ClubMac 88mb Internal	\$469
ClubMac 88mb Dual	\$899

SYQUEST CARTRIDGES

44mb Cartridge	\$63
88mb Cartridge	\$97

NEW
SyQuest 88c

FEATURING



SyQuest®
REMOVABLE
TECHNOLOGY

- SyQuest Drives include
- TWO Year Warranty
 - One cartridge and necessary cables
 - SCSI Director™ Formatting Utility
- SyQuest Cartridges carry a ONE Year Warranty.

CONNER

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
85mb	CP30080E	3.5" Low Profile	17ms	82mb	\$225	\$285
120mb	CP30100	3.5" Low Profile	19ms	116mb	\$285	\$345
170mb	CP30170E	3.5" Low Profile	15ms	160mb	\$315	\$375
212mb	CP30200	3.5" Low Profile	12ms	206mb	\$425	\$485
540mb	CP30540	3.5" Half Height	8.5ms	515mb	\$985	\$1045

Conner drives carry a ONE Year Warranty.

FIVE
YEAR
WARRANTY

MICROPOLIS

Unformatted Capacity	Model	Description	Access Time	Internal	External
1.0GIG	2112	3.5" Half Height/Fast SCSI-2	10ms	\$1699	\$1759
2.0GIG	1924	5.25" Full Height/Fast SCSI-2	11.5ms	\$2849	\$2949

ClubMac OPTICAL Drives



Model	Capacity	Description	Seek	External
CMO-OD3000 Teac	128mb	3.5" Half Height	45ms	\$1049
CMO-LF3004 Panasonic	128mb	3.5" Half Height	45ms	\$1129
CMO-3100E Ricoh	128mb	3.5" Half Height	45ms	\$1089
CMO-5031E Ricoh	594/652mb	5.25" Full Height	28ms	\$2399
Tahiti II MaxOptix	650mb/1.0GIG	5.25" Full Height	35ms	\$3269
128mb Cartridge	3.5" Single Sided			\$39
594/652mb Cartridge	5.25"-512/1024 bytes/sec			\$99

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.

GREAT
Media
PRICES

60 meter DAT \$13
90 meter DAT \$16
CT600N \$19
CT600F \$28
Exabyte 8mm \$18

ClubMac TAPE BACKUP Systems



Capacity	Model	Description	Media	Internal	External
155mb	Teac MT2ST/N50	Analog	CT600N	\$469	\$489
600mb	Teac MT2ST/F50	Analog	CT600F	\$679	\$699
2.0GIG	ARDat	DAT, DDS	4mm	\$1219	\$1239
2.0GIG	WangDAT 1300XL	DAT, DDS	4mm	\$1249	\$1269
3-5GIG	WangDAT 3200	DAT, DDS-DC	4mm		\$1489
2.0GIG	HP 35470A	DAT, DDS	4mm	\$1329	\$1349
3-5GIG	HP 35480A	DAT, DDS-DC	4mm	\$1529	\$1549
2.2GIG	Exabyte EXB-8200	Digital/Helical	8mm		\$1859
5.0GIG	Exabyte EXB-8500	Digital/Helical	8mm		\$2849

Tape Backup Systems include Retrospect v.1.3c Backup Software, ONE cartridge and ONE Year Warranty.

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Tech Support (714)768-1490
24-Hour Fax (714)768-9354

HP SCANJET IIc COLOR SCANNER

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- 400 dpi (800 dpi via interpolation) single-pass scanning delivers superior image quality in both 24-bit color and 8-bit grayscale modes
- Exclusive HP AccuPage technology improves OCR accuracy
- Both image and text scanning mean maximum versatility
- Layered user interface make both basic and advance features easy to use for greater image control
- Print-path calibration optimizes scan settings for selected printer

AUTOMATIC DOCUMENT FEEDER

\$499

- ADF Type, Platen Feed
- 50-sheet capacity
- Document size (5" x 7" up to 8" x 14")

EDUCATIONAL DISCOUNT AVAILABLE

HP SCANJET IIp GRAYSCALE SCANNER \$799

- 300dpi optical resolution delivers accurate, detailed scans
- 8-bit grayscale provides high-quality reproductions of photographs and illustrations
- Exclusive HP AccuPage technology improves text recognition and formatting
- Print-path calibration optimizes scan setting for selected printer



AUTOMATIC DOCUMENT FEEDER \$279

- 20-sheet capacity
- Document Size (7.2" x 10.1" up to 8.5" x 14")



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PACKARD**
Authorized Scanner Dealer

EPSON

Bundled with
Adobe Photoshop
and
ScanTasticPs



EPSON ES-600C

- 300 X 300 optical dpi, 1200 dpi via interpolation
- Epson's TruePass Scanning System (single or multi-pass)

ES-600C with ScanTastic \$945

ES-600C with Full Photoshop & ScanTastic \$1215

EPSON ES-800C

- 400 X 400 optical dpi, 1600 via interpolation
- Epson's TruePass Scanning System (single or multi-pass)

ES-800C with ScanTastic \$1229

ES-800C with Full Photoshop & ScanTastic \$1499

Automatic. Document Feeder \$465

Transparency Unit \$765

MICROTEK SCANMAKER II \$899

- Up to 1200 dpi resolution via interpolation
- 24-bit color/8-bit grayscale
- Bundled with Adobe Photoshop LE



SCANMAKER IIXE \$1179

- Up to 1200 dpi resolution via interpolation
- 24-bit color/8-bit grayscale
- Bundled with FULL Adobe Photoshop

Auto Document Feeder \$479

Graphic Cards • 5 Year Warranty
Displays • 3 Year Warranty



SUPERMAC VIDEOPIGOT



DISPLAYS

SuperMatch 21 Color Display	\$2529
SuperMatch 20-T Multimode Trinitron	\$2459
SuperMatch 20 Color Display	\$1479
SuperMatch 17-T Trinitron Color	\$915
Platinum 21 Two-Page Display	\$999

ACCELERATORS/MULTIMEDIA

ThunderStorm	\$815
VideoSpigot NuBus	\$369
VideoSpigot IIsi	\$329
VideoSpigot LC	\$249
Spigot & Sound NuBus / Pro	\$479/1149
VideoSpigot Pro NuBus / IIsi	\$1069/1229

GRAPHIC CARDS

SuperView	\$365
Spectrum/24 PDQ Plus	\$1515
Spectrum/24 Series IV	\$815
Spectrum/8-24 PDQ NuBus or IIsi	\$815

radius

RADIUS COLOR DISPLAYS

Color Display/21	\$2979
PrecisionColor Pivot	\$949
PrecisionColor Display/19	\$2089
PrecisionColor Display/20	\$2319
PrecisionColor Display/20S	\$2349

RADIUS MONO/GS DISPLAYS

Full Page Display	\$569
Mono Pivot Display /E	\$699
Two Page Display/19	\$899
Two Page Display/21	\$1149
Two Page Display/21E	\$1299

RADIUS INTERFACES

Color Pivot	\$505
PowerView	\$499
PrecisionColor 8XJ	\$489
PrecisionColor 24X	\$1629
PrecisionColor 24XK	\$819
PrecisionColor 24XP	\$489
Two Page Display	\$395
Mono Pivot	\$249
Full Page Display	\$189

ACCELERATORS / MULTIMEDIA

Radius Rocket 25i	\$1199
Radius Rocket 33	\$1939
RocketShare	\$419
SCSI-2 Booster	\$249
VideoVision (Basis System)	\$1625
VideoVision (Presentation)	\$1949

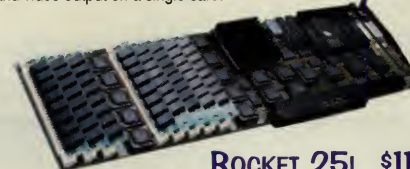


VIDEOVISION (BASIC SYSTEM) \$1625

VIDEOVISION (PRESENTATION) \$1949

PRESENTATION PACKAGE INCLUDES ADOBE PREMIERE 2.0

Everything you need to create hot desktop video presentations. Mix and record high-quality video, audio, and Macintosh graphics to videotape. VideoVision integrates QuickTime and other multimedia applications by providing computer graphics display, video input, and video output on a single card.



ROCKET 25i \$1199

ROCKET 33 \$1939

Radius Rockets can increase the processing speed of the Mac II up to 8 times, allowing the Mac II to exceed Quadra performance

DAYSTAR DIGITAL

33 MHz TURBO 040 \$1429

FASTCACHE TURBO 33-128K ADAPTER \$359

CHARGER \$859

POWERCACHE

(Classic, SE, LC, SE/30, II, IIfx, IIsi, IICI, IIVx, Performa)

* Cache Adapter not included

	w/o FPU	w/ FPU
33 MHz PowerCache*	\$389	\$479
40 MHz PowerCache*	\$559	\$649
50 MHz PowerCache*	\$729	\$859
Equalizer LC	\$169	\$239
PowerCache Adapter	\$40	



CACHE CARDS

FastCache IIsi	\$279
FastCache IIsi with 68882	\$349
FastCache IICI	\$215
FastCache 040 (128K - Q700/900)	\$259
FastCache 040 (128K - Q700/900/950)	\$399

EXPANSION BOARDS

DualPort IIsi	\$165
PowerMath LC	\$115

MACINTOSH MEMORY...

QUADRA 950

16mb Module	\$565
256K VRAM	\$25

VIDEO (Q700/900)

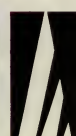
256K VRAM	\$25
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MODEMS...



SUPRAFAXMODEM \$349

14.4 S/R fax, 14.4 data modem v.32bis, v.42bis, MNP 5 w/FaxST, Microphone and Software



PowerModem I (24/96/48 S/R fax modem)	\$135
PowerModem II (24/96/96 S/R fax modem)	\$225
PowerModem III (96/96 S/R fax modem)	\$325
PowerModem IV (14.4/14.4 S/R fax modem)	\$415

POWERBOOK 140/170

4MB Memory Module	\$165
6MB Memory Module	\$205

POWERBOOK 160/180

8MB Memory Module	\$335
10MB Memory Module	\$415

DUO 210/230

4MB Memory Module	\$Call
8MB Memory Module	\$Call

GLOBAL VILLAGE

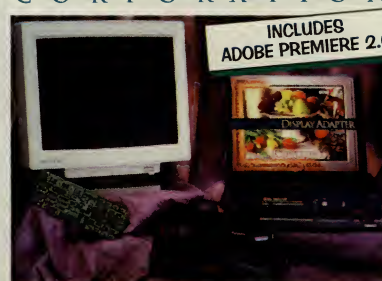
POWERPORT

Bronze (24/96 S/R fax modem)	\$189
Silver (96/96 S/R fax modem)	\$365
Gold (14,400 S/R fax modem)	\$419

TELEPORT

Bronze (24/96 S/R fax modem)	\$189
Silver (96/96 S/R fax modem)	\$359
Gold (14,400 S/R fax modem)	\$419

RASTEROPS CORPORATION



MOVIEPAK \$1499

MoviePak is the real-time JPEG compression-decompression daughterboard for full-motion video digitizing and full-screen QuickTime playback along with full featured video editing software.

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24XLTV / 24MxTV	\$2639/1639
MediaTime	\$1519
24STV	\$759
VideoTime	\$1135
PhotoPro NuBus	\$775

GRAPHIC DISPLAYS

21" Color (2168)	\$2519
20 Multimode Color (2085H)	\$1329
20T MultiScan Trinitron (2075M)	\$2089
21" Mono/Gray Scale (2110)	\$999
15" Mono/GS Portrait (1510)	\$499

COLOR DISPLAY ADAPTERS

RasterOps ProColor 32	\$3195
RasterOps 24XLi / 24Sx	\$1939 / 619
PaintBoard 24 / Li	\$1529 / 829
RasterOps 24Mx / MxQ	\$1165
ColorBoard 264/SE30	\$699
RasterOps 8XLi or 8XL / 8X	\$929 / 465

NEC

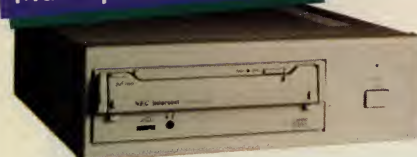
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NEC CDR-74 with PC Interface	\$649
NEC Multimedia Gallery for PC	\$799
NEC CD Express for PC	\$395

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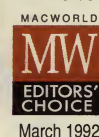
MULTISYNC FG COLOR
DISPLAY SOLUTIONS

NEC MultiSync 3FGx MONITOR

15" multiple frequency color monitor

- Invar Shadow Mask
- MPR-II compliant
- High-contrast polished screen
- Resolution up to 1024 X 768
- Excellent clarity, focus and brightness

\$629



BUY a
NEC 3FGx or NEC 4FG
with the NEW
MacFG 24Xp Video Card
(24-bit for 15" & 17" MultiSync FG Monitors)
and
RECEIVE \$100
from NEC



NEC MultiSync 4FG MONITOR

15" multiple frequency color monitor

- AccuColor Control System
- MPR-II compliant
- Advanced digital controls
- Resolution up to 1024 X 768
- Excellent clarity, focus and brightness

\$759



NEC MULTISYNC FG COLOR MONITORS FEATURE

- Larger, more accurate images
- Multiple-frequency
- 0.28mm trio dot pitch
- Compatible with Mac LC, LCII, II family, and Quadra family
- TWO Year Warranty

MacFG 24Xp is an affordable 24-bit color designed specifically for 15" and 17" MultiSync FG monitors. MacFG 24Xp is compatible with Mac II family, Quadras and Performa 600.

MultiSync 3FGx (15" Color)	\$629
MultiSync 4FG (15" with AccuColor)	\$759
MultiSync 5FG (17" with AccuColor)	\$1315
MultiSync 6FG (21" with AccuColor)	\$2399
MacFG 24Xp NEW	\$499
MacFG 8X VIDEO CARDS	\$649
MacFG 24X	\$1249

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MacUser
September 1992
Silentwriter Model 95

SILENTWRITER MODEL 95 LASER PRINTER

- PostScript Language Level 2
- Automatic interface switching
- Enhanced resolution technology
- Envelope feeder & cassette
- 3 Year On-Site Warranty

MODEL 95f \$1379

- Adobe PostScript Level 2 • 6 ppm • 35 fonts • 2 MB RAM
- HP LaserJet III Emulation • Parallel, Serial, AppleTalk
- Auto Interface Monitor Switching
- 250-sheet Paper Capacity • Built-in Envelope Feeder

MODEL 97f \$1749

- Adobe PostScript Level 2 • 10 ppm • 35 fonts • 2 MB RAM
- HP LaserJet III Emulation • Parallel, Serial, AppleTalk
- Auto Interface Monitor Switching
- 250-sheet Paper Capacity • Built-in Envelope Feeder

NEW Built-In POSTSCRIPT FAX MODEL 95fx \$1859

- Model 95fx combines the award winning Model 95 printer with a built-in plain paper fax
- Fax from any MAC or DOS/Windows PC using the software included with the printer
- The Model 95fx can send & receive faxes to/from any standard fax machine or other Model 95fx

MODEL 97fx \$2199

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WARRANTIES: All items manufactured by ClubMac are returned to ClubMac for warranty repair. All other items carry manufacturer's warranty.
MONEY BACK GUARANTEE: All products manufactured by ClubMac carry a 30 day money back guarantee. ClubMac extends all other manufacturers' return policies to its customers. Non-ClubMac products carry 30 day money back guarantee when specified.
RETURNS: Call for RMA number! Any product that is returned WITHOUT an RMA number will be refused.
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Fujitsu Specials

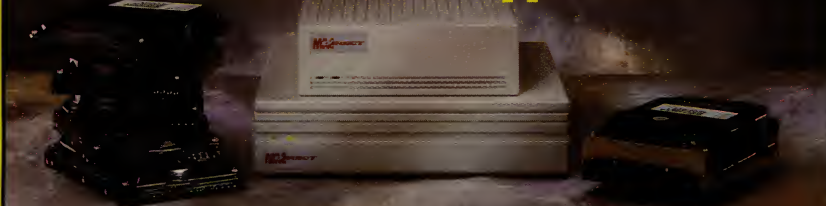
520mb Internal.....\$948
1.2Gig Int.....\$1448
2.1Gig Int.....\$2348

- MacWorlds Editors Choice
- 5 Year Warranty
- MacWorlds fastest Gig!

MAC DIRECT

Specialists in Mac Storage

Conner The Drive That Apple Uses



For 2 years Conner has been one of Apples largest hard drive suppliers!

Conner Drives

	Internal	External
C 42 MB 3.5" LPS, 2 yr warr, 150,000 MTBF	\$198	\$248
C 85 MB 3.5" LPS, 2 yr warr, 150,000 MTBF	\$228	\$288
C 120 MB 3.5" LPS, 2 yr warr, 150,000 MTBF	\$288	\$348
C 170 MB 3.5" LPS, 2 yr warr, 150,000 MTBF	\$318	\$388
C 212 MB 3.5" LPS, 2 yr warr, 150,000 MTBF	\$438	\$498
C 540 MB 3.5", 8.5 ms, 4500 RPM, 2 yr Warr,	\$988	\$1048

These new Conner drives are so reliable, that Conner has been one of Apples largest suppliers of drives. The 150,000 hours Mean Time Between Failure and the incredible speed of the 540 are just two reasons to buy a Conner.

Fujitsu Drives

	Internal	External
330 MB 3.5" 9ms, 5yr warr, 200,000 MTBF	\$848	\$898
425 MB 3.5" 9ms, 5yr warr, 200,000 MTBF, MacWorlds Editors Choice!	\$898	\$948
520 MB 3.5" 9ms, Fast SCSI, 5yr warr, 200,000 MTBF	\$948	\$998
1.1 Gig 3.5" 8.5ms, MB per sec transfer, 5yr warr, 300,000 MTBF,	\$1798	\$1898
1.2 Gig 5.25" 11.5ms, 5yr warr, (MacWorlds Fastest Gig!)	\$1448	\$1498
2.06 Gig 5.25" 11.5ms, 5yr warr, (5,400RPM & Fast SCSI)	\$2348	\$2448
2.4 Gig 5.25" 11.5ms, 5yr warr, (5,400RPM & Fast SCSI)	\$2598	\$2698

*Mean Time Between Failure is the average life expectancy of a drive.

The Fujitsu PicoBird 4 Drives 520, 425, & 330mb



Fast and Reliable!

The NuDesign 3.5" Optical MacWorlds Editors Choice



Optical Drives

NuDesign 3.5" 256mb Optical.....\$1798

NuDesign 3.5" 128mb Optical.....\$998

- MacWorlds Editors Choice!, Nov. '92
- "Fast, inexpensive, good technical support, easy to use-this is a rare combination of qualities for a storage device" (MacWorld)
- 30ms access time ■ Includes cartridge

Ricoh 600mb HyperSpace..\$2898

- 28ms access time
- 1mb per sec transfer
- Read write reliable storage ■ Includes cartridge
- Great for archiving, color scans, etc.

Toshiba 3.5" 1230mb & 877 mb CD ROM

	Internal	External
Toshiba 1230mb 3.5"	\$1598	\$1648
Toshiba 877mb 3.5"	\$1198	\$1298

- 12.5ms Average Seek Time ■ 256k cache ■ SCSI-2
- Internal for CI, Mac II, Quadra

Toshiba 3301.....\$538

- Includes driver CD carrier and cables
- 325ms access time
- MacWorld and MacUsers Highest Rated!

Quantum Drives

	Internal	External
42mb 3.5"	\$208	\$278
85mb 3.5"	\$258	\$328
127mb 3.5"	\$328	\$398
170mb 3.5"	\$368	\$428
240mb 3.5"	\$588	\$658
525mb 3.5"	\$1148	\$1218

Prometheus Modems

Promodem 144i	Internal 14.4 Powerbook Data/Fax with V.42/V.42bis	\$298
Promodem 144e	External 14.4/9600 Data/Fax with V.42/V.42bis	\$298
Promodem 24e	External 2400/9600 Data/Fax with V.42 & V.42bis	\$149
Promodem Mini	External , 2400bps mini unit	\$89

SyQuest Removables

44MB Removable.....\$448.00

88MB Removable.....\$598.00

- 19ms Access time
- Both Drives include Cartridge
- 2 Year Warranty

NuDesign DAT Drives

NuDesign Dat 2.1Gig capability

With SoftBackup\$998

With Retrospect.....\$1098

NuDesign 5.0 Gig Compression Dat

With SoftBackup\$1398

With Retrospect.....\$1498

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stable system software. Factory warranty. Bracket, cables and
software included. 30 Day Money back Guarantee covers drive
products only. Return Authorization number required for returns.
Prices, terms and availability subject to change without notice.

The NuDesign DAT



NuDesign Dat 2.1 Gig capability
With SoftBackup\$998
With Retrospect\$1098

- Up to 2.1 Gig per tape
- Our best buy ever on DAT!
- Up to 10 mb per minute backup time
- Available with a complete version of Retrospect

MAC DIRECT

Monitor Special

Sampo 19" Color ..\$1298

- Two Page displays
- Perfect for DTP & CAD/CAM
- Include Interface cards

Trinitron 20" Color ..\$1898

Full Page Display.....\$398



14" Sampo Color.....\$378

- Plug compatible with the IIsi, CI, and the LC



14" SONY Trinitron.....\$428

- SONY 1302 for the Mac LC.



16" SONY Trinitron..\$1098

- Plug compatible with the Quadra
- Plug compatible with the CI, SI and LC at 640x480

SAMPO 19" Color System 1298.00



Sampo 19" 8 Bit Color System\$1298.00

24 Bit Color System\$1998.00

Mono System\$698.00

Grey Scale System\$998.00

- The SAMPO is a high quality dual page display without the high cost!
- Includes 1 bit, or 8 bit Bit Video board and cable
- 2 page display supports all Mac IIs', the SI, SE-30, SE and the LC

Trinitron 20" Color System

8 Bit Quadra compatible\$1898.00

24 Bit System with RasterOps 24Li\$2898.00

- RasterOps 8x1 board available for all Macs
- The Trinitron-20 is a 20" monitor incorporating Sony's patented technology and one of our best buys! True Trinitron color at a great price!
- Includes 8 bit or 24 Bit Video board and cable
- 2 page display supports all Mac IIs', the SI, SE-30, and the LC

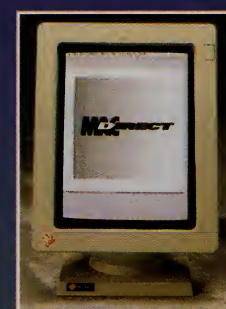
NuDesign Full Page Grey Scale\$398.00

- Plug compatible with SI, CI and Quadra (16 levels of Grey).
- Available with 1 Bit interface card for all Mac IIs', SE-30, SE and LC \$488.00.



20" Trinitron System

- 8 Bit Quadra system\$1898
- With 24 Bit interface\$2898



NuDesign Full Page Display

- Grey Scale for CI, SI, Quadra.....\$398
- II, IIfx, FX, SE30, 1Bit\$488



19" Sampo Color System

- With 8 Bit interface\$1298
- With 24 Bit interface\$1998



UMAX 600 DPI Color Scanner

Umax UC-630 With PhotoShop.....\$1098.00

Umax UC-840 With PhotoShop.....\$1248.00

Transparency/Slide Scanner Option.....\$728.00

Automatic Document Feeder\$498.00

- Rated four mice by MacUser (Dec '91) Rated fastest by MacUser(Dec '91)
- "Boasts the highest vertical resolution..." "Umax produced the best images..." "excel(s) in speed and color accuracy" MacUser

Umax UC-1200S With PhotoShop\$2998.00

Transparency/Slide Scanner Option.....\$798.00

- Incredible 1200 dpi scanning res. recognizes 1 billion colors internally
- Single-pass design increases scanning speed
- Includes Adobe Photoshop

Umax 600DPI Greyscale With Typereader OCR

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- Rated Fastest by MacUser
- 8 1/2 x 14 Scanning area

Umax UC-1200S....\$2998

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Order Tracking (8:30-5:00)
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HARDWARE THE FITS



“ My experience in running large retail organizations for more than 16 years was the person at the top normally heard from customers only when things ‘had not gone according to Hoyle’ somewhere down the line. I would like to be the exception and bring to your attention my experiences of outstanding service from two of your employees during my recent purchase of a RealTech 19" monitor and RasterOps 24XLi card...their responsive service was a refreshing change.”

— Stephen E. Snider

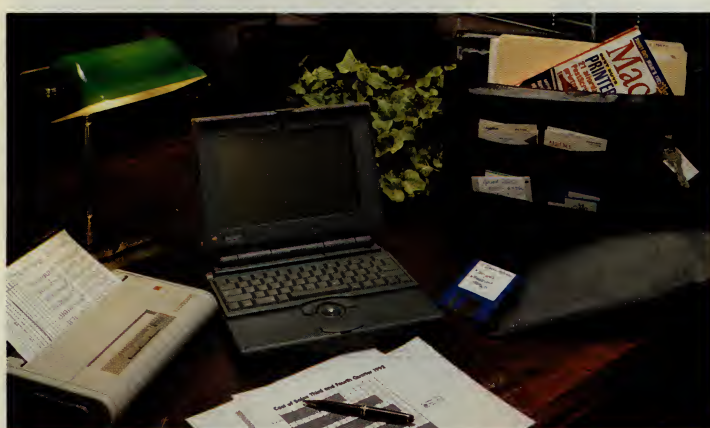
Monitors: all sizes, types, and prices.

	Price	Tube type	640 x 480	640 x 870	832 x 624	1024 x 768	1152 x 870	Auto-syncing	Anti-glare	Mac op-board compatible
A. Radius 21" Color	\$3,069	Hitachi								
RasterOps 21" Color	2,799	Hitachi								
B. SuperMac (SuperMatch) 21"	2,529	Hitachi								
SuperMac 21" Mono/Grayscale	989	—								
C. RasterOps 20" Trinitron Multi-Mode	\$2,329	Trinitron								
Radius Precision Color 20"	2,389	Trinitron								
RasterOps 20" Hitachi Color	1,469	Hitachi								
D. RealTech 20" Trinitron Multi-Mode	1,895	Trinitron								
E. SuperMac 20" (SuperMatch)	1,499	Hitachi								
SuperMac 20" (SuperMatch Dual-Mode)	2,499	Trinitron								
F. NEC 17" 5FG Color	\$1,589	Toshiba								
RasterOps 16" (RasterOps Sweet 16)	1,249	Panasonic								
G. RealTech 17" (RealTech Multi-Mode)	995	Hitachi								
H. Sony 17"	1,189	Trinitron								
I. Seiko Instruments 17" CM1760LR	1,249	Trinitron								
J. Radius Precision Color Pivot 15"	\$959	Non-Trinitron								
K. RealTech 15" Grayscale	449	—								
L. Seiko Instruments 14" CM1445	479	Trinitron								
M. Sony 13" Color	689	Trinitron								

Monitors



PowerBooks



These PowerBook 160s and PowerBook 180s each include: 8 Mb of RAM, expandable to 14 Mb; display with 16 grayscale levels; 1.4 Mb floppy disk drive.

PowerBook® 160

25 MHz 68030. Supertwist display. 40, 80, or 120 Mb hard drive.

PowerBook 160 with 8/40 \$2639
PowerBook 160 with 8/80 2999
PowerBook 160 with 8/120 3359

PowerBook® 180

33 MHz 68030 FPU. Active matrix display. 80 Mb hard drive.

PowerBook 180 with 8/80 \$4319
PowerBook 180 with 8/120 4679

POWERBOOK MEMORY UPGRADES & ACCESSORIES

PowerBook 160 & 180 Memory Upgrades (6/8/10).....\$289/409/499
PowerBook Duo 210 & 230 Memory Upgrades (4/8/12)279/559/809
Auto Power Adapter..... 89

Charger/Reconditioner169
Auxiliary Power Pack.....169
Radius PowerView509
PowerBook Battery.....79

The PowerBook Duo 210 8/80 and PowerBook Duo 230 8/80 transform into desktop computers by using the optional Duo Dock. Each PowerBook Duo 210 or 230 includes:

- 640 x 400 Supertwist liquid crystal display with 16 grayscale levels
- 8 Mb of RAM, expandable to 24 Mb
- EverWatch Battery Saver technology
- Optional internal modem

PowerBook® Duo 210 8/80

\$2,529
Lease: \$69/month

25 MHz 68030 microprocessor. 80 Mb hard drive.

All PowerBooks listed here are equipped with a 19mm trackball.

PowerBook® Duo 230 8/80

\$2,889
Lease: \$79/month

33 MHz 68030 microprocessor. FPU, 80 Mb hard drive.

PowerBook Duo 230 with 8/120.....\$3249

POWERBOOK MODEMS

Global Village PowerPort Gold/Silver/Bronze.....\$459/399/209
MassMicro FM 24/96 PB.....189
Zoom Pocket Modem119

POWERBOOK CARRYING CASES

Leather Attache (A)\$139
SuperBrief Double-sided Carryall (B)....79
Companion Case (C)59



Accelerators

DO YOU FEEL THE NEED FOR SPEED?
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TransWarp LC (25 MHz)459
TransWarp LC (50 MHz w/50-FPU) ... 1319
TransWarp 040 (25 MHz)1749
1.44 SuperPlus Drive279
QuadraLink.....199

FUSION DATA

TokaMac Ilci.....\$1259
TokaMac Ilsi1259
TokaMac ELC969

NEWER TECHNOLOGY

Quadra 700 Overdrive.....\$259
Image Magic NuBus769
Image Magic FX/PDS699
Image Magic Quadra/PDS699

DAYSTAR DIGITAL

PowerCache Accelerators
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40 MHz Accelerator549
50 MHz Accelerator719
25 MHz Turbo 040 (Ilci,Ilsi).....1099
33 MHz Turbo 040 (Ilci,Ilsi).....1349
FastCache Turbo 25 (040)259
FastCache Turbo 33 (040)339
Charger (Photoshop accelerator)799
PowerCache Adapter40

PERIPHERAL LAND

Quick SCSI Accelerator.....\$339

RADIUS

Radius Rocket 25i.....\$1239
Radius Rocket 332069
SCSI-2 Booster.....249
Rocket Share.....419

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Lets you use inexpensive unshielded twisted-pair (UTP) telephone wire instead of expensive coaxial cable for local area networks.

10Base-T Hub/8\$265



Asanté EN/SC (SCSI-to-Ethernet adapter). For Macs without available slots.

EN/SC\$339

Asanté MacCon 3 Ethernet card. Automatically configures to media used.

MacCon 3 Card\$216

TechWorks GraceLAN Update Manager

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We carry a full line of Asante and Dayna cards.

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DaynaPORT E/II-T NuBus Card\$149

DaynaPort E/Z. Ideal for Macs that don't have a slot for a network interface card.

DaynaPORT E/Z\$269

Dayna EtherPrint

Divides your network into multiple zones.

Dayna EtherPrint\$335

Dayna EtherPrint Plus\$439



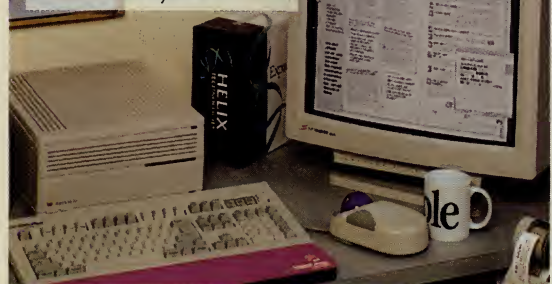
Systems Configured to your specifications

Here are a few of the systems/workstations we sell. We'll let you mix and match your choice of components.

Macintosh IIfx Business Solution

Macintosh IIfx with 5 Mb of RAM, 212 Mb hard drive, Supermac 21" platinum monitor with video card, cache card, and Key Tronic MacPro Plus extended keyboard.

\$4,095
Lease: \$112/month



\$2,729
Lease: \$77/mo.

Mac IIsi Solution

Macintosh IIsi with 5 Mb of RAM, 120 Mb hard drive, Seiko Instruments CM 1445 14" Trinitron monitor, and Key Tronic MacPro Plus extended keyboard.

\$7,849
Lease: \$215/month

**Quadra 700/Trinitron
Intermediate Graphics
Solution** Quadra 700, 8 Mb of RAM, 520 Mb hard drive, RealTech 20" Trinitron monitor w/PaintBoard Li and Key Tronic MacPro Plus extended keyboard.

Hours: 8 am-7 pm Central Standard Time

30-DAY MONEY-BACK GUARANTEE on all hardware (except printer consumables and special-order items). Before returning merchandise, call our Customer Service Dept. toll-free to receive a returned merchandise authorization number (RMA), which must be included with any products you return. No C.O.D. returns, please. Thank you for your cooperation. ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

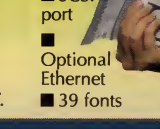
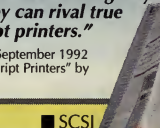
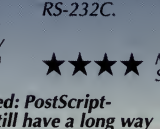
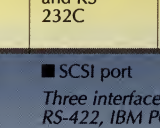
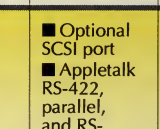
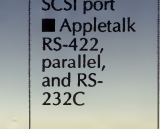
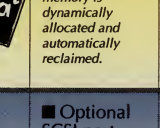
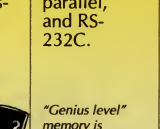
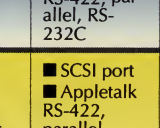
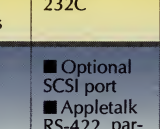
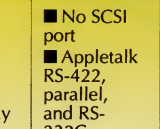
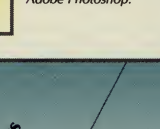
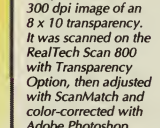
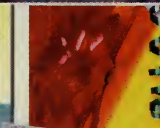
Scanners

FAX: 1-409-539-4141
CALL: 1-409-760-2400

Toll-free tech support:
1-800-364-MACS

Flatbed desktop scanners for 24-bit color, 8-bit grayscale, and black/white images. Ideal for mid-range output or position prints for mockups/presentations.

	Price	DPI	Brightness & contrast levels	Scanning area	Flat art	Transparencies	Slides	Software
MICROTEK								
Scanmaker II	\$909	600	14	8.5 x 13.5	■			Includes limited version of Adobe Photoshop
Scanmaker IIXE	1,179	600	14	8.5 x 13.5	■			Includes full version of Adobe Photoshop
Scanmaker 1850 Slide Scanner	1,569	1850	14	2.5 square inches		■		Includes full version of Adobe Photoshop
REALTECH								
Scan 800 Optional Adobe Photoshop	\$1,199 200	800	200	8.5 x 11.75	■			Includes Scan-Match color calibration software
Scan 800 with Transparency Option	1,695	800	200	8.5 x 11.75	■	■		
UMAX								
UC 630	\$1,119	600	51	8.5 x 14	■			Includes full version of Adobe Photoshop
Transparency Option	729	(600)	(51)	6 x 9	■	■		
UC 840	1,289	800	51	8.5 x 14	■			Includes full version of Adobe Photoshop
Transparency Option	729	(800)	(51)	6 x 9	■	■		
UC 1200S	3,019	1200	51	8 x 11.8	■			Includes full version of Adobe Photoshop
Transparency Option	729	(1200)	(51)		■	■		



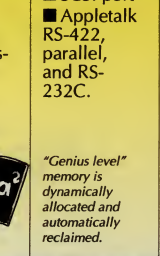
Scanners & Printers

Laser printers

The right printer can do wonders for your productivity. Do you need speed? Adobe PostScript Level 2? Do you need to print a lot of pages each month?

	Dpi	Engine speed RAM	Interpreter Microprocessor	Duty cycle Paper trays	SCSI port Interfaces	Resident fonts Misc.	QMS
NEC Silentwriter Model 95 $\uparrow\uparrow\uparrow\uparrow\frac{1}{2}$							
\$1,469 Lease: \$40/month	300 dpi 6 pages/min. 2 Mb RAM (expandable to 5 Mb)	Adobe PostScript Level 2 Motorola 68000 processor	6,000 pages per month Built-in envelope feeder & 250-sheet tray; optional 2nd tray available in letter or legal sizes	No SCSI port Appletalk RS-422, parallel, and RS-232C	35 Micro-fine toner and NEC's patented "Sharp Edge" technology create sharp black print quality		NEC
NewGen $\uparrow\uparrow\uparrow$							
	400 dpi 4 pages/min. 4 Mb RAM (expandable to 16 Mb)	PostScript compatible Weitek XL-8220 processor	3,500 pages per month Optional 2nd paper drawer	Optional SCSI port Appletalk RS-422, parallel, RS-232C	35		NewGen 400P \$1,879 Lease: \$51/month
RealTech $\uparrow\uparrow\uparrow\uparrow\frac{1}{2}$							
	300 dpi 9 pages/min. 2 Mb RAM (expandable to 10 Mb)	Adobe PostScript Level 2 Weitek RISC processor	5,000 pages per month Optional 2nd paper tray & cassette feeder are available for \$250 (for both)	SCSI port Appletalk RS-422, parallel, and RS-232C.	35 ATM font rendering technology builds raw type characters 4 to 5 times faster, enabling the RealTech Laser to print complex documents faster than other printers in its price range.		RealTech Laser \$1,595 Lease: \$44/month
Texas Instruments MicroLaser XL Turbo							
\$2,795 Lease: \$77/month	300 dpi 16 pages/min. 2.5 Mb RAM (expandable to 10.5 Mb)	Adobe PostScript Level 2 Weitek RISC processor	25,000 pages per month Optional 2nd paper drawer	Optional SCSI port Appletalk RS-422, parallel, and RS-232C	35		TEXAS INSTRUMENTS
Texas Instruments MicroLaser Plus							
\$1,249 Lease: \$34/month	300 dpi 9 pages/min. 1.5 Mb RAM (expandable to 4.5 Mb)	Adobe PostScript Level 1 Motorola 68000 processor	10,000 pages per month Optional 2nd paper drawer and envelope feeder	Optional SCSI port Appletalk RS-422, parallel, and RS-232C	17 Available with 35 resident fonts (\$1349)		
The only 11x17 printer with Adobe PostScript Level 2 for less than \$3500.							
	Choice of 300 or 400 dpi 15 ppm (letter size); 8 ppm (tabloid size) 4 Mb RAM (expandable to 16 Mb)	Adobe PostScript Level 2 Weitek RISC processor (and ATM font rendering technology)	20,000 pages per month Two paper trays included (one tray for letter size; one tray for tabloid size.)	SCSI port Three interface ports: Appletalk RS-422, IBM PC parallel, and RS-232C.	35		
RealTech Laser 400							
\$3,195 Lease: \$88/mo.							
QMS 860 Hammerhead							
\$4,279 Lease: \$117/mo.	600 dpi 8 ppm (letter size); 4.6 ppm (tabloid size) 12 Mb RAM (expandable to 32)	Adobe PostScript compatible Intel 80960CA RISC processor	10,000 pages per month Optional 2nd paper cassette	SCSI port Optional Ethernet	39 fonts		

The photo above is a 300 dpi image of an 8 x 10 transparency. It was scanned on the RealTech Scan 800 with Transparency Option, then adjusted with ScanMatch and color-corrected with Adobe Photoshop.



"Genius level" memory is dynamically allocated and automatically reclaimed.

"...be forewarned: PostScript-clone printers still have a long way to go before they can rival true Adobe PostScript printers."

Quote from MacUser September 1992 issue. "Personal PostScript Printers" by Bruce Fraser.

MACWORLD MAGAZINE September 1992



Jeanne is thrilled that she can print proofs of her company newsletter on tabloid-size paper. No more tiling!



THE WORLD DRIVE DESIGN EVEN FAST

THE DEC DSP-3105 1-GIG DRIVE



Gentlemen, start your engines. Introducing the DEC DSP-3105 1-gigabyte drive. This Eddy award-winning monster moves like Ricochet Rabbit on double espresso. In fact, it's the world's fastest 3.5 inch drive. Thanks, in part, to a 5400 RPM spindle speed and a whopping 512K drive cache. With our minimum-footprint Cyclone™ enclosure, a great price, and 5-year warranty, no one can touch it for value. Says *MacUser*: it's "a dream drive mechanism for most Mac users."

Cyclone enclosure	\$1899
Classic-style footprint enclosure	\$1849
Internal	\$1799

Hey! What the heck is a Cyclone Drive, anyhow?

No need to yell. Cyclone is our name for the small footprint "brick" drives in our line. Our highest performers. They feature a sturdy metal enclosure (You know those black boxes you read about that survive in plane crashes? They're made of metal, too. A coincidence? We think not). A rugged, continuous-use, auto-switching 40-watt power supply, compatible around the globe. And class B FCC approval. They're small, yet, they crank. Perfect for use with those huge Macs that take up a lot of your desk's real estate. Available as a DAT drive or hard discs from 512 MB and up. Oh, yeah, one more thing: to our knowledge, no one offers a better value on small footprint, high capacity drives. Check it out.



CYCLONE DAT DRIVES

If you're looking for DAT, you'll love dis. Cyclone DAT drives. They feature the zephyr-like Wang DAT drive mechanism – the industry standard for reliability. Our own Cyclone small-footprint chassis. And a price that won't dis you. Our standard Cyclone DAT drive has a 2.0 GB capacity. The compression model, up to 5 gigs. Both come with Dantz™ Retrospect back-up software, and a 90-meter DAT tape, free. Dat's all you need.

Cyclone Standard DAT	\$1199
Cyclone Compression DAT	\$1349

ORDER DIRECT. CALL:

WORLD'S FASTEST EASIEST TO MOVE HARDWARE: \$1899.



SYQUEST 5110C 88/44 DRIVE

You want to upgrade your removable drive to 88 megs, but you've got a shelf full of old 44s staring you in the face. You have two options. One, use the old cartridges as coasters at geek cocktail parties. Or two, buy the new Spin Syquest 5110C drive that reads and writes both 44 and 88 meg cartridges. True, this drive does not format 44 MB cartridges, but we have a way around that - pre-formatted 44s.

Syquest 5110C 44/88 Drive	\$599
Syquest 88 MB Removable	\$499
Syquest 44 MB Removable	\$399
Syquest Media	
Unformatted 44 MB	\$61
Unformatted 88 MB	\$99
Formatted 44 MB	\$85
Formatted 88 MB	\$139



ZERO FOOTPRINT DRIVES

We've gotten letters lately - mostly in crayon - from a few folks asking why we call these drives "zero footprint" when they obviously exist in three dimensions and take up space. We'd like to point out that when placed under your Plus or Classic or SE it takes up no more space than the computer already does. Zero. Neat trick, huh? Our sturdy zero-footprint drives feature a number of different mechanisms from makers like Conner, Quantum, Toshiba. Check the matrix below for the capacity you need. And please, put down that crayon.

Capacity (MB)	Model Number	Average Access Time (msec)	Transfer rate (K/sec)	MTBF (Hours)	MFG warranty (months)	Internal Drive Price	External Drive Price	Cyclone Drive Price
Conner								
85	CP-30080E	16	300	50000	24	\$229	\$309	
120	CP-30100	16	1300	150000	24	\$289	\$359	
170	CP-30170E	16	1400	150000	24	\$319	\$389	
213	CP-30200	15	2000	150000	24	\$459	\$529	
Quantum								
42	ELS 42S	19	1600	250000	24	\$189	\$279	
85	ELS 85S	17	1800	250000	24	\$239	\$319	
127	ELS 127S	17	1800	250000	24	\$319	\$389	
170	ELS 170S	17	2000	250000	24	\$349	\$409	
240	LPS 240S	16	2300	250000	24	\$519	\$589	
525	LPS 525S	10	2900	350000	24	\$1149	\$1199	\$1249
80 (Pwrbk)	GRS-80	17	1900	150000	12	\$349		
120 (Pwrbk)	GRS-120	17	1800	150000	12	\$469		
160 (Pwrbk)	GRS-160	17	1900	150000	12	\$519		
Toshiba								
870	MK-438	12	1500	250000	36	\$1169	\$1249	\$1299
1.2 GB	MK-538	12	2800	250000	36	\$1479	\$1549	\$1599
DEC								
1.05GB	DSP-3105	9.5	2600	250000	60	\$1799	\$1849	\$1899

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30 DAYS TO DECIDE.

If you're not satisfied, neither are we (we're referring, of course, to Macintosh peripherals only). That's why every Spin product comes with a 30-day money back guarantee. Test-drive any Spin product. Give it a real workout. If you're not happy, return it within 30 days for a refund. Was that good for you?

MORE THAN JUST A LOW PRICE.

Flip through these pages (not right now, it's just a figure of speech), and you'll see a lot of low prices. The difference with Spin is that you get more. And not just a little more. We include many free things that others charge you for. Like a double-shielded SCSI cable. External terminator. A power supply designed for constant use. Not to mention our own Spin Disk Utilities with free upgrades for a year, system software, and unlimited tech support as long as you own a Spin drive. We aim to please. Call one of the other guys and ask what they'll give you for free. The cardboard box? The owner's manual? Then call us back.

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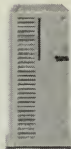
*CPU Only



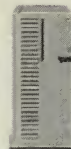
Powerbook 160 4/40 - 4/80 - 4/120
\$2329 / \$2669 / \$2939



IIfx 4/80-4/230-5/80 w/CD
\$2509* / \$2849* / \$2949*



Quadra 700 4/0
\$3399*



Quadra 950 8/0
\$5399*



Duo 230 4/80 - 4/120 / Duo 210 4/80
\$2499 / \$2869 / \$2149



LC II 4/160
\$1429*

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CHECK US OUT!

FEATURING



SyQuest
REMOVABLE
TECHNOLOGY

Model	External
SyQuest 44mb (*One Cartridge Included)	\$399
SyQuest 88mb (*One Cartridge Included)	\$499
SyQuest 88mb C** (*One Cartridge Included)	\$615
Internal 44mb SyQuest (for Quadra 900&950)	\$365
Internal 88mb SyQuest (for Quadra 900&950)	\$465
Internal 88mb C SyQuest (for Quadra 900&950)	\$595
SyQuest Dual 44mb (*One Cartridge Included)	\$725
SyQuest Dual 88mb (*One Cartridge Included)	\$895
SyQuest Dual 44/88mb (*One 44 & 88 Cartridge)	\$895
SyQuest Dual 88C mb (*One Cartridge Included)	\$1145
SyQuest 44mb Cartridge/10 Pack	\$63/\$620
SyQuest 88mb Cartridge/5 Pack	\$98/\$480

All SyQuest Drives come with FWB™ HDT Formatting Software.
SyQuest carries a TWO year Warranty on Drives and ONE year on Cartridges.
Internal solutions for Quadra 900 & 950 also available.

** READS AND WRITES 44 AND 88 CARTRIDGES. Does not format 44 cartridges.

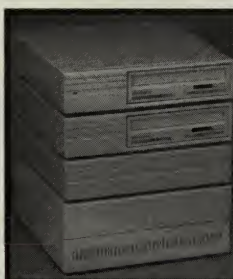
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Deluxe Low Profile Cases and all Metal Power & Drive Activity LED's. Dual SCSI Ports for device chaining. Simple push button SCSI ID. Internal filter for noise reduction. 40 Watt power supply with 58 watt peak. Autoswitching from 110v/220v. Clear Window on bottom for easy termination checking & removal.

Pocket Drive Enclosures

2.5" drives fit with a snap. SCSI address selection. No power adaptor needed, the power source is the ADB Port (Keyboard). Passthrough SCSI connector allows more devices to be chained. Cases small enough to fit inside of a pocket.

\$85 Half Height
\$145 Full Height
\$85 Pocket Drive



PowerBook/Duo Corner

All the extras for upgrading your PowerBook or Duo...

PowerBook 160/180 Memory	
4mb/6mb/8mb/10mb	\$195/\$295/\$395/\$495
PowerBook Cables (HDI 30-25 or 50)	\$35
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1.2gb	13ms	5.25"FH	\$1475	\$1575
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ONE year Warranty on 3.5" Drives and
TWO Years on 5.25" Drives

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Unformatted Capacity	Speed	Size	Internal	External
425mb	9ms	3.5"HH	\$925	\$985
520mb	9ms	3.5"HH	\$995	\$1055
1.2gb	15ms	5.25"FH	\$1545	\$1645
2.0gb	15ms	5.25"FH	\$2575	\$2675
2.4gb	12ms	5.25"FH	\$2795	\$2895

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Unformatted Capacity	Speed	Size	Internal	External
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*GO•160mb	16ms	2.5"PB	\$535	\$635
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LPS 525mb	10ms	3.5"TH	\$1035	\$1095
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ELS 85mb	17ms	3.5"TH	\$235	\$295
ELS 127mb	17ms	3.5"TH	\$295	\$355
ELS 170mb	17ms	3.5"TH	\$335	\$395
Pro 700mb	10ms	3.5"TH	\$1235	\$1295
Pro 1.0	10ms	3.5"HH	\$1515	\$1575
Pro 1.2	10ms	3.5"HH	\$1675	\$1735

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Unformatted Capacity	Speed	Size	Internal	External
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		CD-ROM		
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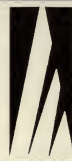
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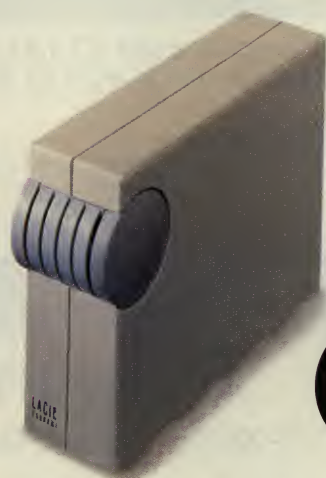
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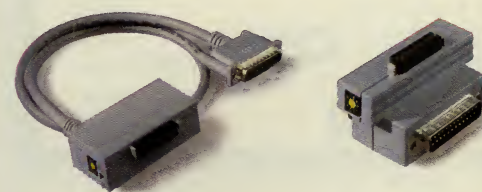
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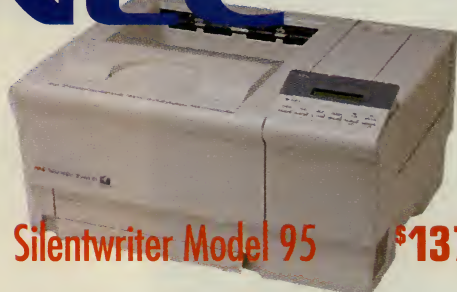
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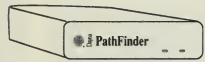
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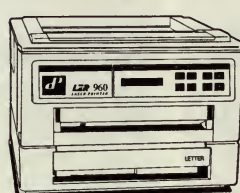
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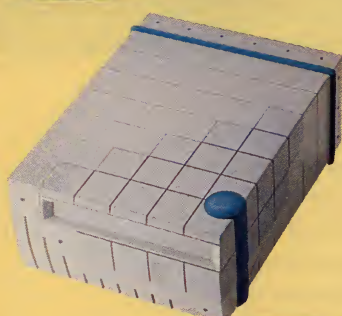
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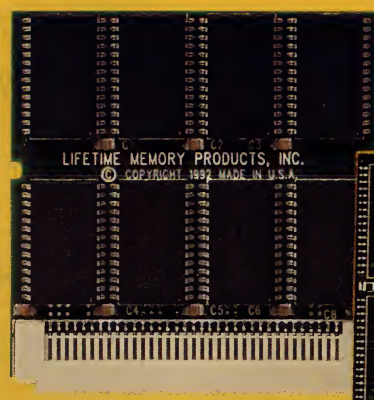


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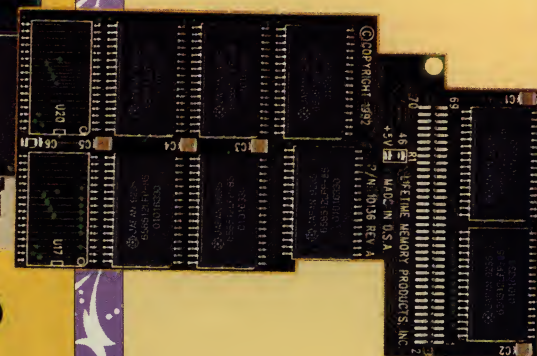
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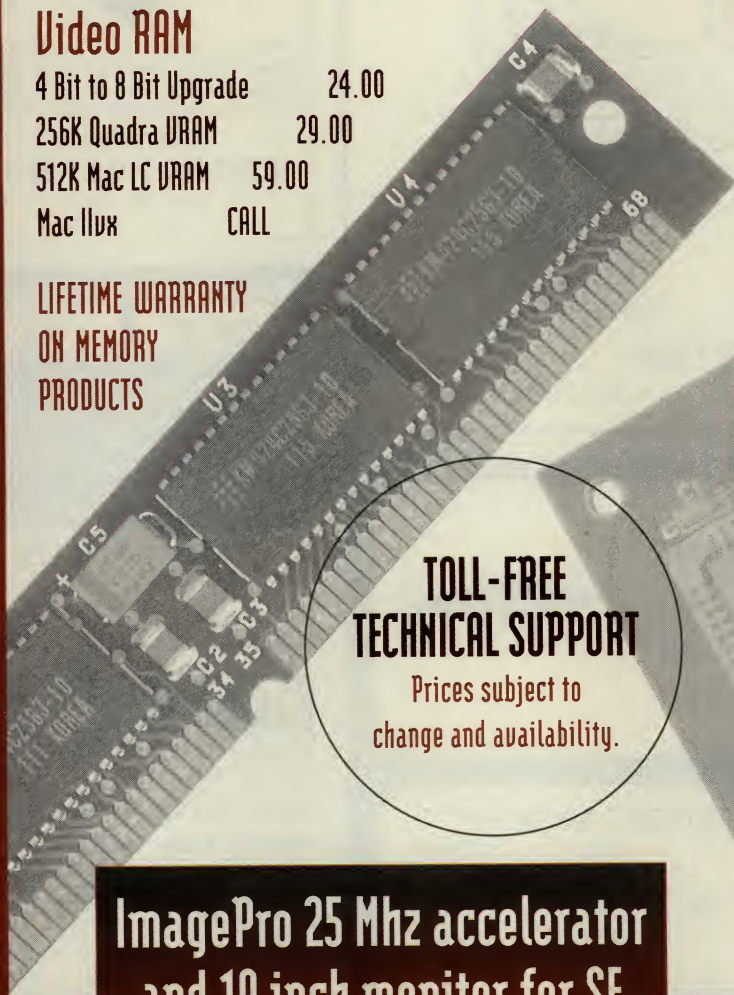
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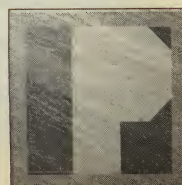
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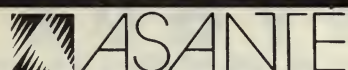
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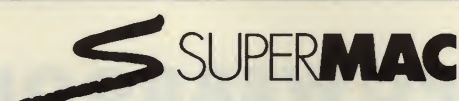
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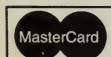
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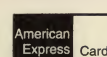
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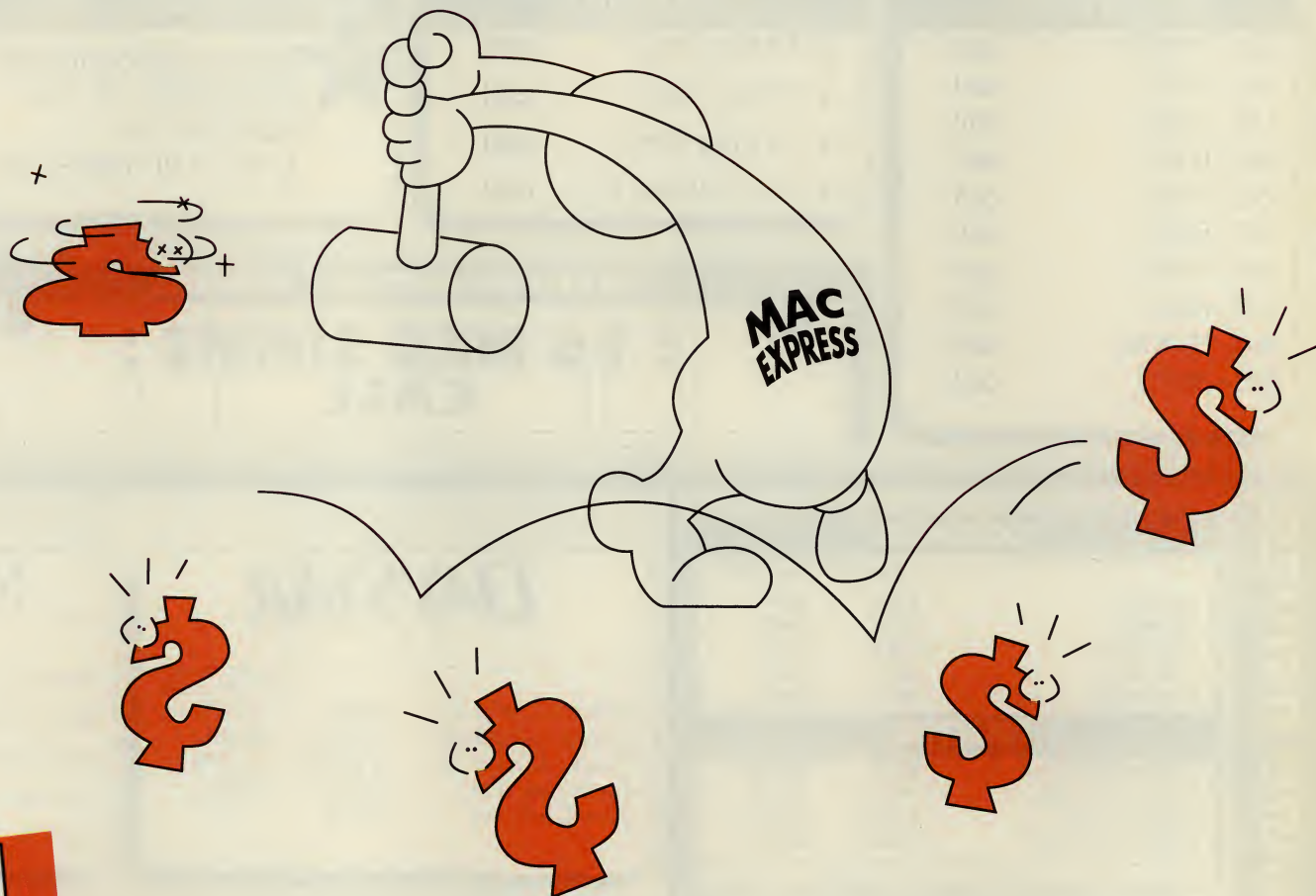
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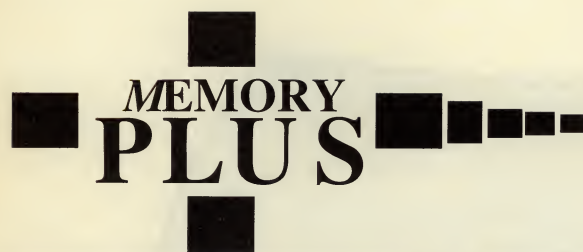
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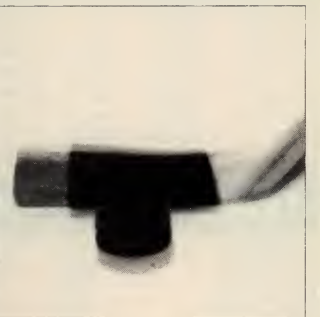
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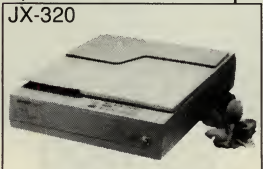
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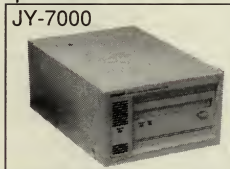
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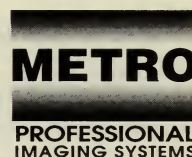
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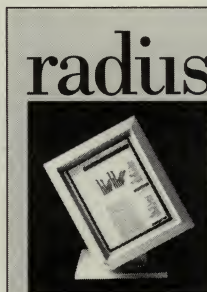
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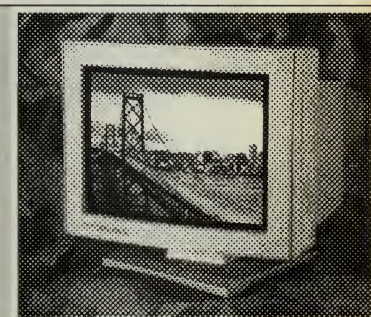
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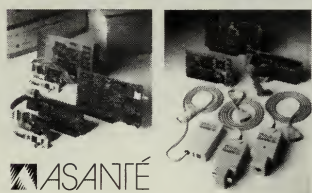
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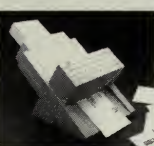


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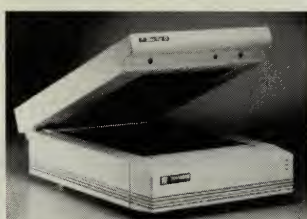
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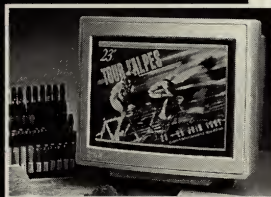
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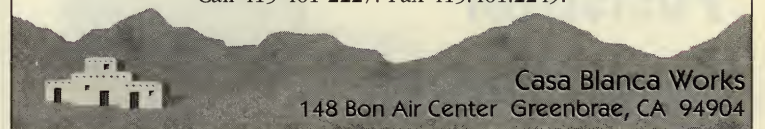
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170	170MB	1"Hi	17ms	8-12Mbit	\$ 399 \$ 479
240	240MB	1"Hi	16ms	15-30Mbit	\$ 529 \$ 599
502	525MB	1"Hi	10ms	18-38Mbit	\$ 1,129 \$ 1,199
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127	127MB	1"Hi	17ms	8-12Mbit	\$ 329 \$ 399
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240	240MB	1"Hi	16ms	15-30Mbit	\$ 529 \$ 599
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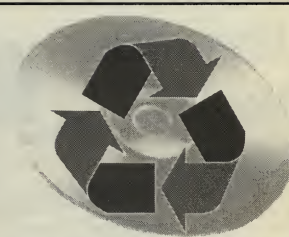
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HyperCard

From Page 1

product, it seemed to make sense to have a single, unified tool strategy," said Kirk Loevner, vice president of the Apple Developer Group, HyperCard's new home. "The strategic value of HyperCard really is as an end-user tool rather than as an application."

Users said AppleScript will benefit from the HyperCard front-end and debugging tools, since the AppleScript editor released to developers reportedly has frustrated many potential scriptors.

Apple now has to determine if it will continue development efforts started at Claris. One option is a core-code rewrite of the program in C++ to make it platform-independent and add color support.

Stack users and developers reacted favorably to the announcement.

Danny Goodman, a computer book author and stack developer in San Francisco, said AppleScript and HyperCard will work well together. "It's a union made in heaven," he said. "AppleScript needed a readily accessible user-interface builder, something familiar to developers."

Goodman, who last year spearheaded a campaign to make Claris

pay more attention to HyperCard, said the user lobbying may have paid off. "I think it was the cumulative effect of the current HyperCard community recognizing the strategic importance of HyperCard for the Mac," he said.

Others agreed that the move will benefit both HyperCard and AppleScript. "This will be the jump-start for making AppleScript scripting and Apple events in general really take off," said Neil Ticktin, editor in chief of MacTech, a developers magazine published monthly by Xplain Corp. of Los Angeles.

"It makes a lot of sense," said Gerth Hannsen, president of San Francisco hardware developer Radiant Inc. "We played a little bit with Apple events, but the problem has been [lack of a] graphical front end to AppleScript."

Users also said the clear commitment from Apple that the announcement represents will help HyperCard the most. "This is truly great news," said Bernard Aboba, an Oakland, Calif.-based author of a Mac communications book. "There had been a lot of rumors — few of them good — and this puts them to rest. There really is no substitute for HyperCard, so it's good

that Apple is recognizing this and moving it forward."

Other users focused criticism on Claris' management of the product.

"Whoever [at Apple] picks it up and runs with it is likely to accomplish more than the Claris folks did," said Bill Woodcock, author of a Mac networking book in Santa Cruz, Calif. "The relative stagnation it suffered through during the Claris-administered period certainly didn't improve its image or reputation."

Ticktin agreed. "Considering the shenanigans that Claris has played with some of the other developer tools, such as XTND, it's a good thing that it is going to Apple," he said. "Claris appears to be not at all interested in the plight of other Mac developers. To have HyperCard out of their hands is really a good step."

Overall, developers said, HyperCard's future now appears bright. "We're very pleased because we felt that HyperCard was competing with FileMaker Pro for attention at Claris," said Dorothy D'Attoma, president of SoftStream International Inc., a Dartmouth, Mass., software publisher. "We're looking forward to some important new energy being thrown into the product." □

Highs, lows mark HyperCard history

HyperCard, hailed as a groundbreaking "software erector set" for users when it debuted, nevertheless had a difficult time finding the right market niche to become profitable.

When Bill Atkinson designed HyperCard between 1985 and 1986, it was intended as a card-file and painting program to run on handheld devices, such as those Apple now calls personal digital assistants.

Instead, the product, released on the Macintosh in August 1987, was bundled free with all new Macs until September 1992.

HyperCard's scripting language and externals interface, added relatively late in the development process, made it popular among in-house programmers and educational institutions.

Apple transferred HyperCard to its software subsidiary in 1990. It was intended to be part of a set of system software moved to Claris. However, none of the other products made it to Claris, leaving HyperCard high and dry and unprofitable.

Claris sold "significantly over 100,000 total units" from its 1990 acquisition of HyperCard until the end of 1992, according to Mike Davison, director of the HyperCard group at Claris. The majority of those sales were the \$199 developer kits, and sales

"exceeded the business plan by 15 percent" last quarter, said Claris CEO Dan Eilers.

However, the product reportedly was not paying its own way, in part because Claris had to support the many users who got HyperCard free from Apple with new CPUs. "The level of revenue achieved by Claris over time wouldn't have naturally built up the infrastructure to support a 3 million-user product," Eilers said.

"We brought out the HyperCard Player, which was a first phase of turning HyperCard into a business," Eilers said. "Before that, we were in essence competing with a free product: the version bundled with Macs."

Claris also developed Version 2.1, which added System 7 support, and the QuickTime Tools, externals that added movie-playing capabilities to stacks, released last January.

HyperCard also posed unusual challenges for Claris, both in how to market it and the type of support required. "The developer is not really the traditional target market for Claris' applications," Eilers said. Moving the product back "lets Apple focus on what it does best and Claris focus on what it does best." — *By Raines Cohen*

Kodak trims cost of portable inkjets

By Neil McManus

Rochester, N.Y. — Eastman Kodak Co. recently reduced the prices of its Diconix portable inkjet printers and extended their warranties to three years.

The Diconix 701, a 300-dpi inkjet, now is priced at \$479, down from \$549. Weighing in at 5.6 pounds, the printer comes with a sheet feeder that holds up to 30 pages of plain paper or transparencies.

The Diconix 180si, a 192-dpi inkjet, has been reduced from \$399 to \$329 in its serial configuration. The 2.9-pound printer accepts both single-sheet and continuous-feed paper.

To use the Diconix printers, Mac users need a Kodak Mpower interface kit, which includes a QuickDraw driver and a cable. The Mpower 701 interface kit, priced at \$79, comes with a serial-to-parallel cable. The Mpower 180si, which retails for \$39, includes a nine-pin-to-25-pin serial cable.

In addition, Kodak has extended the warranties of the Diconix printers from one to three years, including parts and labor. The three-year warranty is retroactive to printers purchased after Dec. 1, 1992.

Eastman Kodak Co. is at 901 Elmgrove Road, Rochester, N.Y. 14653. Phone (716) 724-4000 or (800) 344-0006; fax (716) 726-3758. □

Radius screens cut emissions

San Jose, Calif. — Radius Inc. last week announced it has redesigned three monochrome monitors to meet Swedish guidelines on emissions considered dangerous to computer users' health.

The Radius Pivot, Full Page Display and Two Page Display/21 are now available in versions that Radius said meet or exceed Swedish guidelines for low emission and have new anti-glare screens. Although the

price of the Pivot and Full Page Display remain unchanged at \$849 and \$699, respectively, the Two Page Display/21E costs \$200 more than a version without the low-emission feature. Radius said it will continue to sell the original Two Page Display/21 for \$1,399.

Radius Inc. is at 1710 Fortune Drive, San Jose, Calif. 95131. Phone (408) 434-1010; fax (408) 434-0770. □

CD-ROM

From Page 1

ROM-based devices also will appear this year, making CD-ROM usage even more ubiquitous. Sources said hardware production for Apple's entry in this field, the Sweet Pea, is on schedule for a July debut.

In addition, The 3DO Company of San Mateo, Calif., is putting a CD-ROM drive in its 3DO Interactive Multiplayer, a consumer device that will hook up to television sets. The company also is producing and using CD-ROMs extensively in-house.

"CD-ROM is the biggest reservoir there is for a lot of data, in fact the only large reservoir out there," said Bart Faber, senior marketing vice president at 3DO. "We are using [CD-ROMs] now as the medium for product testing, product development and archiving, [and we] envision it as the next paradigm."

Prices of systems that allow users to record their own CD-ROM have dropped sharply in recent years. Vendors such as Phillips Consumer Electronics Co. and JVC Information Products Co. now offer desktop recording systems for around \$10,000. Pinnacle Micro last month announced a system priced at less than \$4,000. These systems, which make limited quantities of CD-ROMs, include a write-once recording unit and premastering software.

According to Julie Schwerin, president of InfoTech of Woodstock, Vt., businesses often use

homemade CD-ROMs to distribute technical documentation and financial and marketing databases.

"Where the number of copies is low (less than 20) and the number of times a new disc must be created is high, internal replication makes sense," Schwerin said. "The biggest surprise is that it has become chic to author a CD-ROM in [many] organizations."

JVC has targeted corporate customers with a Mac-based CD-ROM recording system called the Personal Archiver. It lets users simply copy files to the Archiver's hard drive, where they can be pressed onto a Mac-compatible CD-ROM using a single command.

According to a report by Kathryn Hilton of Santa Clara, Calif.-based InfoCorp, cost savings and quick turnaround are the payoff for companies distributing information via CD-ROM rather than paper.

Data security is another reason companies will use CD-ROMs, said Ed Craig, manager of a division of Hanson Graphics in Baton Rouge, La.

"For our own sense of security, we adopted this technology early on," said Craig, who uses the Philips recorder and Optical Media software to archive all the company's work. "For us it's not only a question of how little I can invest to do this but also the feeling that critical data is secure on CD-ROM." □

Kirsten Parkinson contributed to this report.

Projected sales of CD-ROMs to businesses

	1992	1993	1994	1995	1996
Units bought (in thousands)	1,025	1,330	1,650	2,225	3,000
Average OEM selling price (per unit)	\$200	\$170	\$150	\$130	\$115
Total industry revenue (in millions)	\$205	\$226	\$248	\$289	\$345

Source: InfoCorp

Performa

From Page 1

consumers are more interested in modular Macs than in the compact Classic design, Fox said.

He said Apple will expand the Performa line by adding additional peripherals, such as an external CD-ROM drive, and it will increase the software bundled with systems.

Most dealers sell Performas bundled with integrated software or financial-management packages; the 600 CD comes with about a dozen CD titles.

Third parties who participated in the bundle offers said the dividend came in publicity rather than earnings. "It gave us great exposure, so when the user went to buy another product, they considered Claris," said Bruce Chizen, acting vice president of U.S. sales at Claris. "However, as with any OEM relationship, the benefit was less profit and more exposure."

According to sources, Apple may start including up to a dozen software packages with Performas this spring and expand built-in RAM and hard drive capacities as well. Products being considered for bundling include video games, screen savers, painting programs and contact-management programs, sources said.

According to Fox, a 68040 Performa capable of competing with 486-based clones will be added to the Performa line sometime in the future.

Fox said that 91 percent of Performa systems are being used in the home, Apple's target market. The majority of home users (33 percent) bought Performas as an educational machine for their children. Nineteen percent bought them so they could do work at home; 18 percent purchased Performas for home-based businesses; and 8 percent bought them for home management.

Of the home buyers, 62 percent had never owned a computer before. Of the 38 percent who had owned a computer before, 30 percent owned IBM PCs and compatibles. □

Pricing

From Page 1

RAM. It will be priced from \$1,859 for a 4/80 model to \$2,959 for an 8/230 configuration with on-board Ethernet and the internal AppleCD 300i CD-ROM drive built in, sources said.

► **Centris 650.** All configurations of this model include a 25-MHz '040 except for the low-end model, for which users can choose to forgo Ethernet and opt for the less-expensive 68LC040. It includes three NuBus slots, one PDS and RAM expandable to 136 Mbytes. Prices will range from \$2,699 for a 4/80 system to \$4,379 for an 8/500 model, sources said.

► **Quadra 800.** The new Quadra model will include a 33-MHz '040, three NuBus slots, one 68040 PDS and built-in Ethernet. It starts at \$4,679 for an 8/230 model and goes up to \$6,399 for the model with 8 Mbytes of RAM and a 1-Gbyte hard drive, sources said.

Prices will drop on some current Quadra models in response to the new offering, sources said. Prices on some models could decline as much as 35 percent. New configurations

with larger hard drives also will be available.

► **PowerBook 165c.** Apple's first color notebook also will debut next week, priced at \$3,399 in a 4/80 configuration, sources said.

Sources said Apple may fine-tune its CPU pricing before next week's introduction.

The first major overhaul of Apple's desktop line in two years reportedly pleased corporate users, who have drifted away from purchasing Macs because they were too pricey or lacked features such as built-in Ethernet, color and internal CD-ROM drives.

"It looks like Apple has got things going [with the CPU introductions], and that's encouraging to users who want more of a choice than just DOS," said Joe Nagy, chief facilities engineer for the U.S. Mint in Denver.

Some corporate users said they will hold off purchasing until PowerPC-based Macs debut. "The new Macs sound super, both in terms of price and performance. But I'll turn my ears up when I see the PowerPC," said Jeffrey Van-Skyhawk, manager of information technology at Bose Corp. of Framingham, Mass. □

Illustration

From Page 1

allow close-up views, and a new copyfitting feature will permit adjustments to word spacing, letter spacing and leading.

New color features will include the ability to drag colors from a palette and drop them onto objects and lines. Users also will be able to drag new colors into the color palette and edit them. The program will allow creation and editing of colors by CMYK (cyan, magenta, yellow, black), RGB (red, green, blue) and HSL (hue, saturation, lightness) models.

A tint-selection feature will let users automatically generate a range of tints from 10 percent to 100 percent of any color.

► **Illustrator.** The current Mac version of Illustrator is 3.2, although Adobe shipped

Illustrator 4 for Windows in May 1992. The Mac upgrade reportedly will jump ahead to Version 5.0.

With this new version, Adobe will respond to users' requests for an editable preview mode, which FreeHand and the Windows version of Illustrator already possess. Currently, Mac Illustrator users edit images in a wireframelike view.

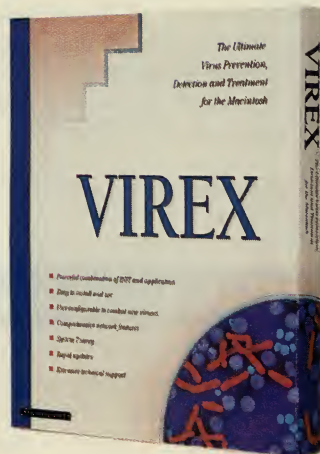
Illustrator 5.0 reportedly also will add a Layers palette similar to that in FreeHand. Users will be able to click on icons in the palette to set whether an object is in the foreground, background, printing layer, nonprinting layer and so on. Users will be able to select multiple layers by holding down the Shift key and dragging and also will be able to select noncontiguous layers.

Like Adobe Photoshop, Illustrator will use filters to apply special effects to images. □

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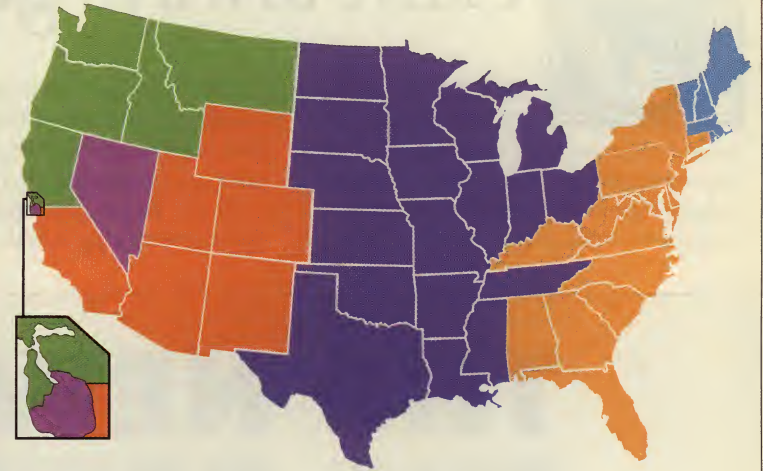
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Looking ahead



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Feb 15	GA Spec. Rpt. Modems	Feb 4	Feb 2
Feb 22	Presentations	Feb 11	Feb 9
March 1	Mapping software	Feb 18	Feb 16
March 8	GW Spec. Rpt. Database add-ons	Feb 25	Feb 23
March 15	Scanners	March 4	March 2
March 22	UPS hardware	March 11	March 9
March 29	Applications development Data-analysis hardware	March 18	March 16



Can't always get what you want

That story in The New York Times last week about the Clinton team going into shock after discovering that the White House is littered with typewriters rather than more modern instruments explains a lot, doesn't it? A lot

about both the past administration and the current one. But at least William J. has his own CompuServe account, if those who trade in such information are to be believed.

This is not to accuse either the previous or the present gang of rank incompetence,

of course. That definitely would be unkind and also quite probably inaccurate. Since the Knife has always made kindness and accuracy top priorities, he has sworn to refrain from releasing actual figures about the availability of the many new CPUs that

Apple will introduce next week.

If you dispense with numbers, you're usually left with generalizations. In the case of Apple meeting demand for the new crop, there's every indication that the company once again will hit the ground stumbling.

Consider the current situation: Those sleek PowerBook 180s still are as rare as Marxists in Phoenix. Ditto Quadra 950s and almost any Mac configuration that includes a CD-ROM drive. Duos are in much better supply, probably because the peripherals drought eased up only recently, although the Knife has received a disturbingly large number of reports of Duo unreliability.

THE NEWER THE BETTER

The company that was first with the original PowerBook memory modules is first again with memory for the new generation of 160, 180, 210 and 230 PowerBooks.

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8MB	+	+	+	+				
6MB	+	+	+	+	+	+	+	+
4MB	+	+	+	+	+	+	+	+
2MB	+	+	+	+	+	+	+	+

Instructive shortage. Watch carefully and you might learn something. Since the new PowerBook 165c really is nothing more than a PowerBook 180 with a color passive-matrix eight-bit color display rather than the 180's crisp active-matrix screen, the relative availability of the 165c may tell us something about the current 180 shortage.

One group claims it's the scarcity of active-matrix displays in quantity that's causing the shortage, while another group points the finger at the lack of the 180's 120-Mbyte hard drive. 165c Macs will have an optional 160-Mbyte drive, so if the world suddenly is flooded with color laptop Macs, you can safely deduce that the 180 display is our butler.

Remaindered rumors. Regardless of policy, not all the news fits. For example, the Knife reports that the top folks at the late Claris HyperCard team received very little notice of Apple's surprise decision last week to bring the product back home. The notice was so short, in fact, that most of those on the team who got any word beforehand can measure it in hours.

Then there's the case of the mislabeled PowerBook. You'll remember the item a few weeks ago about the 145 that really was a 140. Now the Knife reports several additional sightings, each of which Apple claims is a one-time occurrence. □

The Mambo Kings sing songs of mugs. If you think you deserve to join the band, check with the Knife at (415) 243-3544, fax (415) 243-3650, MCI (MactheKnife), AppleLink (MacWEEK) and CompuServe/ZiffNet/Mac.

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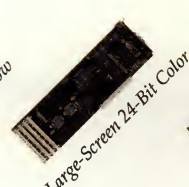
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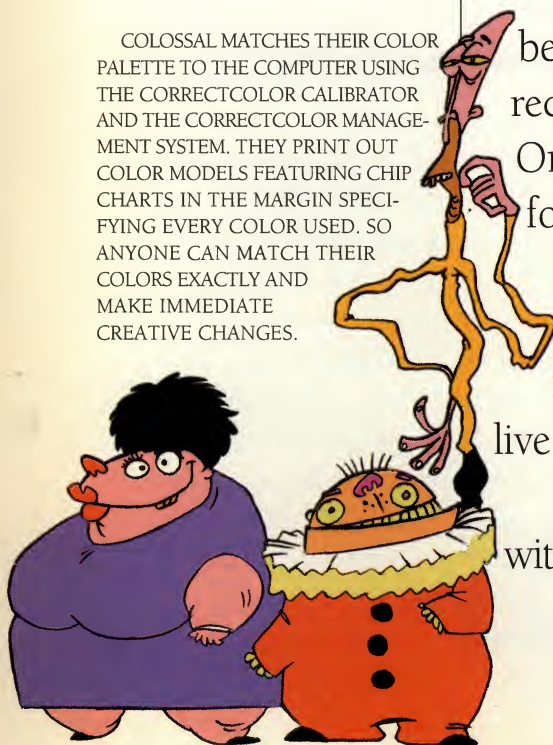
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COMPUTER ILLUSTRATOR/ART DIRECTOR,
COLOSSAL PICTURES, SAN FRANCISCO

COLOSSAL MATCHES THEIR COLOR PALETTE TO THE COMPUTER USING THE CORRECTCOLOR CALIBRATOR AND THE CORRECTCOLOR MANAGEMENT SYSTEM. THEY PRINT OUT COLOR MODELS FEATURING CHIP CHARTS IN THE MARGIN SPECIFYING EVERY COLOR USED. SO ANYONE CAN MATCH THEIR COLORS EXACTLY AND MAKE IMMEDIATE CREATIVE CHANGES.



RasterOps offers displays from 16" to 21", 8-bit, 24-bit and 32-bit display adapters, the most accurate calibration devices available, photorealistic printers, and digital video display adapters. Our products are now being used for everything from design to color-critical printing. Because leaders in their respective fields depend on products from the leader in true color technology.

We put the industry's best technical support behind all our products. In fact, RasterOps was recognized by Apple Computer, Inc. as an Apple Online Services Outstanding Information Publisher for 1992.

So when your reputation's on the line, specify the line of displays, display adapters, calibrators and printers from RasterOps. We don't just give you color you can live with, we give you color you can make a living with.

For more details about why people who make a living with color make it with RasterOps, call 1-800-SAY-COLOR.

RASTEROPS®
THE ART & SCIENCE OF COLOR



RASTEROPS IS YOUR SINGLE SOURCE FOR RELIABLE COLOR IMAGING TECHNOLOGY. FOR THE FIFTH CONSECUTIVE YEAR, OUR PRODUCTS HAVE BEEN AWARDED WORLD CLASS AWARDS BY MACWORLD MAGAZINE.



"DESIGNING AND PRODUCING BROCHURES AND OTHER COLLATERAL PIECES GOT A LOT EASIER WHEN I DISCOVERED RASTEROPS PRODUCTS. WE HAVE THEIR 19" MONITORS AND 24XLI CARDS THROUGHOUT THE OFFICE, AND THEIR WYSIWYG COLOR HAS SIMPLIFIED MY CLIENTS' LIVES AS WELL AS MY STAFF'S."

LESLIE SINGER, OWNER
SINGER DESIGN, NEW YORK CITY



"RASTEROPS' TECHNICAL SUPPORT HAS BEEN GREAT. WHEN I NEEDED TO INSTALL MORE RAM ON MY 21" MONITOR AND 24XLI BOARD FOR SOME DETAILED BROCHURE DESIGN WORK, THEIR CUSTOMER SERVICE PEOPLE TALKED ME THROUGH IT STEP BY STEP RIGHT OVER THE PHONE. I WAS UP AND RUNNING AGAIN SO FAST THAT I DIDN'T MISS A SINGLE DEADLINE."

SHERRI TAKAHARA, PROJECT COORDINATOR
JACOBS FULTON DESIGN, PALO ALTO

RASTEROPS CORPORATION, 2500 WALSH AVE., SANTA CLARA, CALIFORNIA 95051, FAX: 408.562.4065



Fuse LocalTalk and Ethernet.

Our new InterRoute/5 connects 4 LocalTalk networks to Ethernet.

InterRoute/5

- Full AppleTalk-TCP/IP gateway with routing of up to 4 LocalTalk and 1 Ethernet nets.
- Supports AppleTalk Phase 1, Phase 2 and transition routing.
- Supports TCP/IP: MacIP (incl. Telnet and MacTCP), IPtalk (incl. atalkad) and IP tunneling.
- Custom ASIC and 8 separate DMA channels for faster LocalTalk performance.
- 3-way management: in/out-of-band & SNMP.
- Flash EPROM for firmware upgrades via software.
- Includes StarCommand software for router & gateway configuration and management of all our hubs & routers.
- Large LocalTalk networks can be split into 4 smaller nets.
- Can mount in the new Farallon Concentrator for easily expandable network design.



Choose the wrong router, and you may be playing with fire.

Go with the new InterRoute/5™ and you've got one of the most versatile and reliable routers available.

The InterRoute/5 provides high-performance AppleTalk routing and full TCP/IP gateway services between four LocalTalk networks and Ethernet. It features a dual-bus architecture, a 16MHz processor, and quick five megabytes per second input/output. And it supports key standards like IPtalk,

MacIP, and IP tunneling.

The InterRoute/5 is easily managed and configured from any Mac with our unique StarCommand™ software which is included. Or use an SNMP console.

What's more, you can use the InterRoute/5 as a module in Farallon's new Concentrator for routing between LocalTalk and Ethernet modules.

It's one of the most powerful routers available. So give us a call for our free guide, "Building a Macintosh Network." **1-800-998-7761.**

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